THE JOURNAL OF GAS LIGHTING
WATER SUPPLY & SANITARY IMPROVEMENT

VOL. XCIV. No. 2247.] LONDON, JUNE 5, 1906. [58TH YEAR. PRICE 6d.

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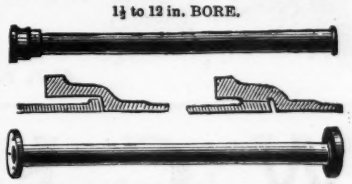

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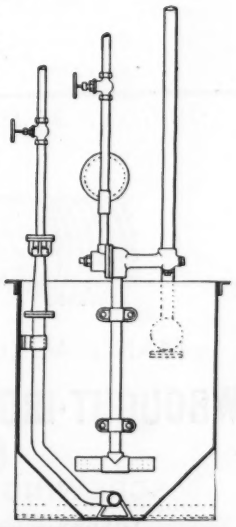

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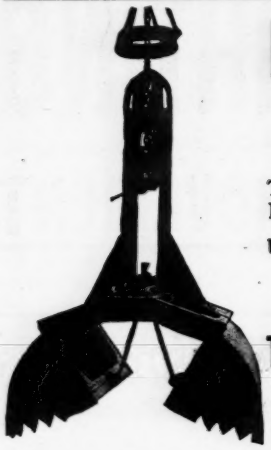

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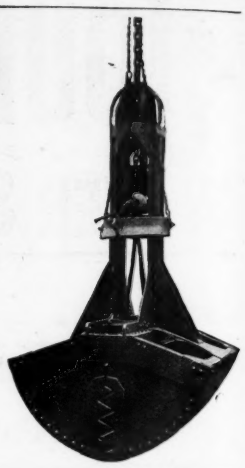

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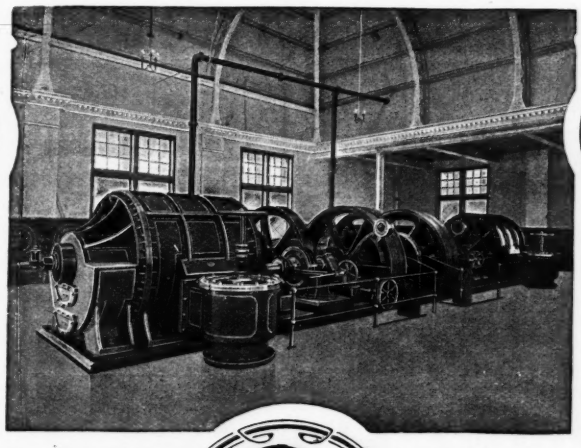

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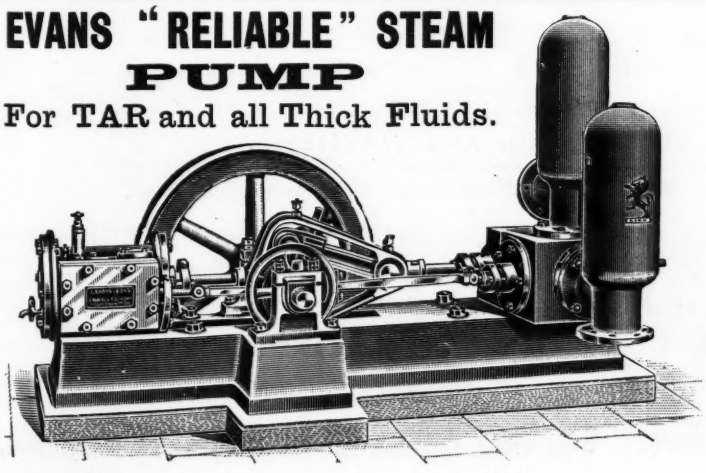

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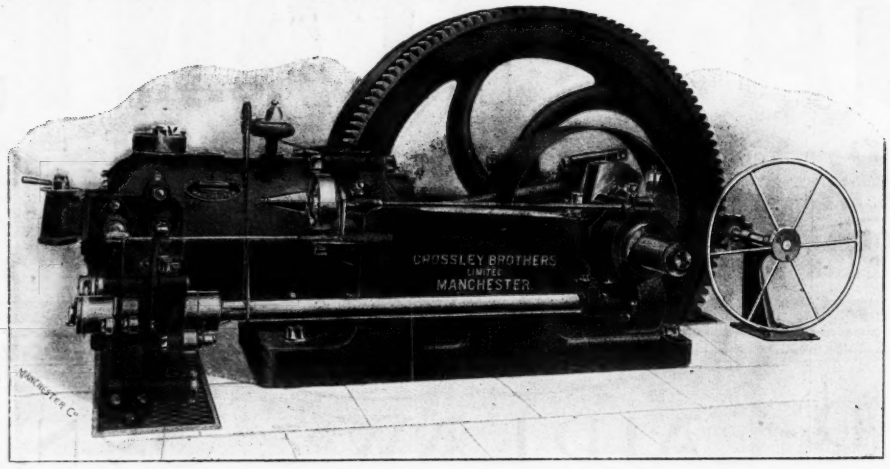

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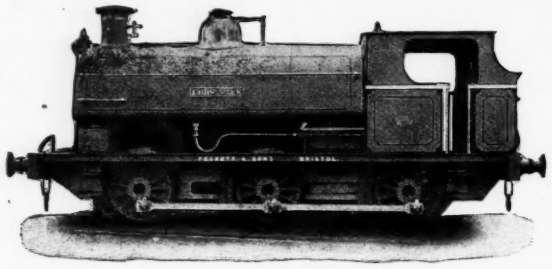

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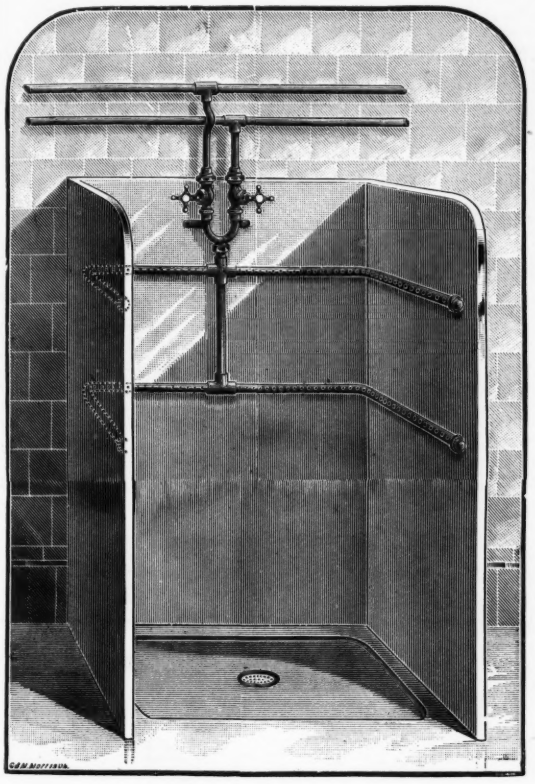

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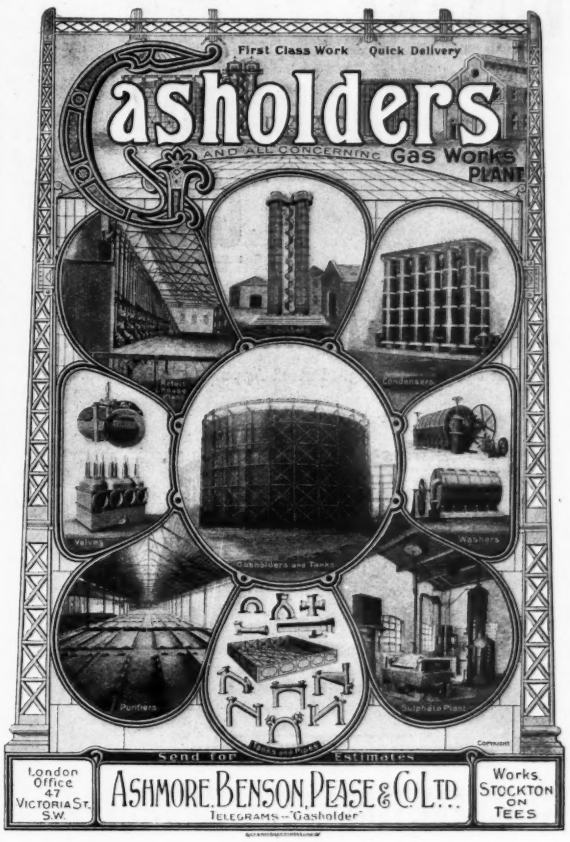
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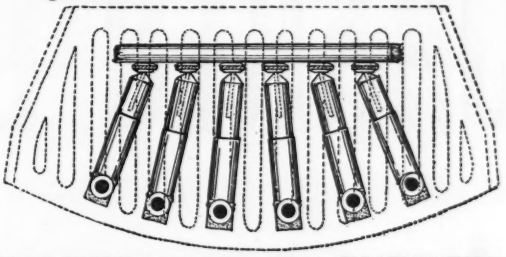

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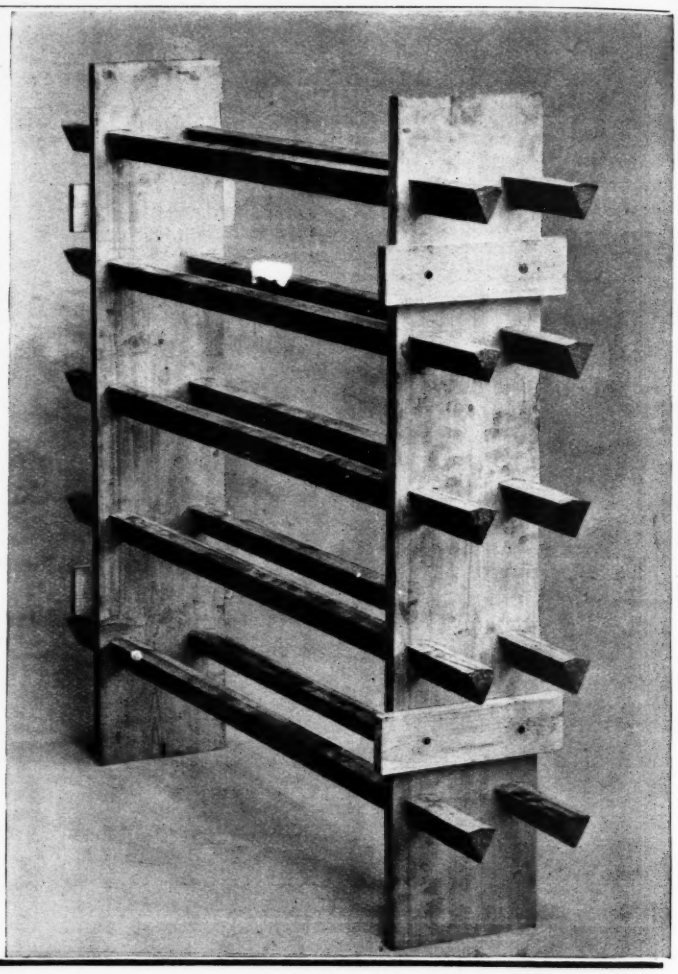

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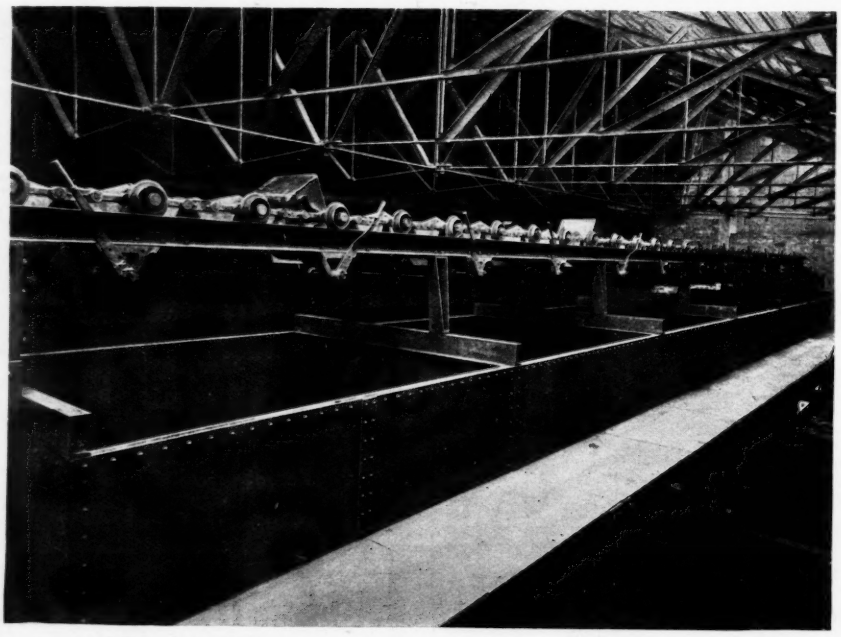

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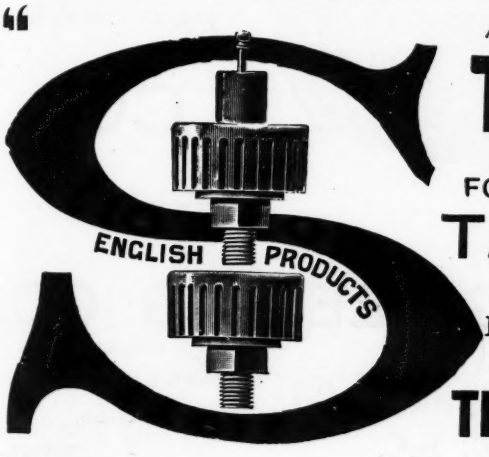

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Average Horizontal Candle Power per cubic foot. . . .	**41·02**	**27·50**	**32·36**	
Pressure in inches of Water . .	**1·6**	**8·0**	**2·8**	
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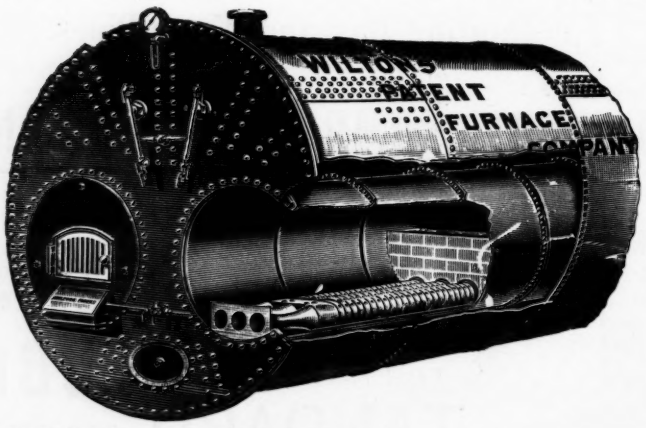

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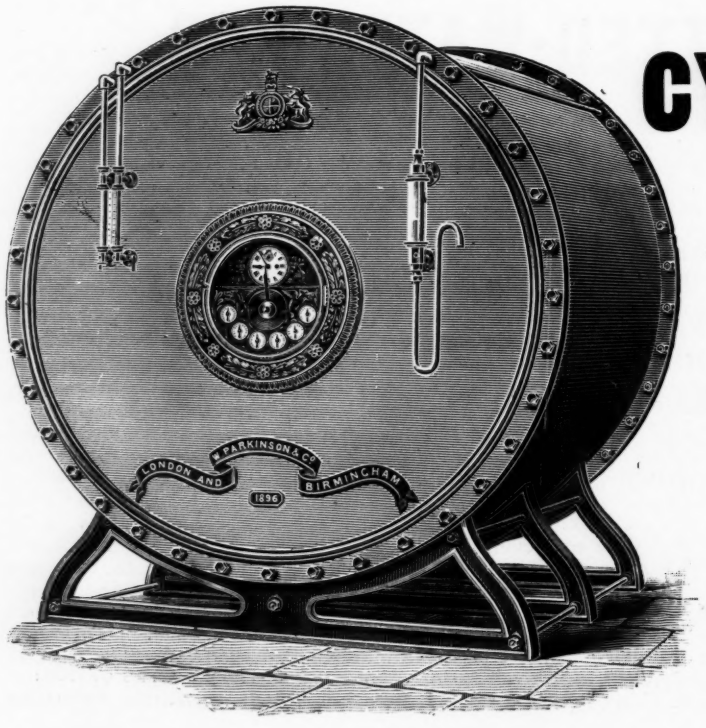

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VOL. XCIV., No. 2247.—TUESDAY, JUNE 5, 1906.

EDITORIAL NOTES—GAS, &c.

The Institution Programme and Report—Suggestion for a Meeting in Dublin.

THE complete programme for the annual meeting of the Institution, which commences on the 19th inst., is now, with the report of the Council, in the hands of the members. In the former there is little change from the preliminary outline which we were enabled to present in these columns on the 1st ult. In addition to the six papers then announced, Mr. John Lyne, of Wexford, has been entered for a paper on "Carburetted Water Gas for Small Gas Undertakings;" and the only other alteration in the plans is that the excursion trip on the Friday will be to Boulogne instead of to Folkestone, with (as formerly proposed) an optional extension to Boulogne. We are pleased to see the inclusion of the paper by Mr. Lyne, as it will give to those in charge of small works a deeper interest in the technical side of the proceedings than they would otherwise have had. In so composite a body as the Institution, it is only right that all ranks of the membership should receive consideration in the programme. Of course, Mr. D. Bruce Anderson's paper, though (we anticipate) more political than technical in character, also opens up a question that will closely touch the managers of small concerns, because whatever benefit there may be in the associated management of such undertakings, grouping for united management must mean the pruning down of first opportunities for the persevering man to rise from the rank of workers to full responsibility, and only to a slight extent give enlargement to opportunities for those of higher qualifications. But in the present day personal considerations must sink before those material benefits which may accrue from associated management. These matters are referred to here to indicate that there will be topics under discussion at the forthcoming meeting that will appeal directly, as well as indirectly, to the managers of small works; and therefore it is hoped that there will be a good attendance of such members to subscribe their personal experience and views to the debates upon these subjects.

There are in all, as previously indicated, seven papers, representing, apart from the address of the President (Mr. Charles Wood), the technical provision for the meeting. Four of the papers refer in one way or another to gas production; and the three which do not have no relation to the trading or commercial interests of the industry, nor to gas utilization. Excepting the utilization of gas from what follows, the fecund subject of trading is one that is left very much now to the District Associations; and perhaps it is as well, though opinions are divided as to the propriety of the course. But when words fly, so does time; and therefore at the supreme convention of the gas profession, it is preferable that the technical and higher political affairs of the industry should not be allowed to suffer through the consideration of subjects which can be better debated at the more frequent gatherings of the members of the District Gas Associations. After what appeared on the 1st ult., there is no occasion to again mention the authors of the papers and their chosen subjects; but, although commercialism and gas utilization are so completely absent from the programme, the titles of the promised contributions indicate a good selection of didactical and controversial subject-matter. Nothing discussable can be expected to arise from the report of the Council, and the President's Address being dignified by exclusion from controversy, the success of the actual meetings will rest almost entirely upon the sway of the papers in inciting discussions of excellent quality. The remainder of the programme is composed of the stereotyped formality, except in one notable particular. A departure from preceding London meetings is made in the general throwing open of the works of the London Companies, at stated times daily, to the inspection of members. The social engagements will embrace a reception and dance, at the invitation of the President and Mrs. Wood, on the Wednesday evening.

There is an item in the programme for which we wish to ask sympathetic and favourable consideration. It is the question of the place at which next year's meeting is to be held; and a proposal will be presented for the direction of the members as to a visit being paid to the Irish International Exhibition in Dublin. There are cogent reasons for giving to the proposition friendly countenance. Firstly, the discussion twelve months ago on the question of the meeting-place for this year evidenced a not insignificant desire to occasionally have the annual reunion away from London; and, however suitable the Metropolis may be from the point of view of convenience, there is unquestionably a danger, without a break now and then, of the London meetings cloying. In the second place, Ireland is a strong contributor to this year's programme. Of the seven papers, three are from gentlemen actively engaged in the administration and management of gas undertakings in the Sister Isle. In the third place, the exhibition is not to be merely of native import, but is being organized on a scale that will give to it a genuine international character. In the fourth place, the favourable decision of the Institution will undoubtedly be a strong inducement to gas plant and appliance manufacturers to make the Gas Section one worthy of the prestige and position of the industry; and this will be rendering an excellent service to the gas industry of Ireland. The members of the Institution will thus see that they largely hold in their hands the power of making a brilliant success of what may otherwise be only an ordinary success. We hope they will exercise that power. The Alliance and Dublin Consumers' Gas Company may be depended upon to do their part to encourage the exhibitors. It cannot, of course, be expected that the Gas Section at Dublin will be the equal of the magnificent display at Earl's Court; but it is hoped that it will exceed other precedent, and rank second to Earl's Court. On the whole, we cannot see in the immediate future a more propitious opportunity for making a break in the line of London meetings than this offers for 1907.

The report of the Council does not suggest much point for comment. It shows that, within the limits of their ability for activity, they have been engaged, entirely or by delegation, in several matters; but that, had it not been for their praiseworthy action in connection with legislation affecting the testing of gas, and the Home Office inquiry into the working of railway sidings, the report would have been a barren one. Their inability to extend their activities lies in the direction of insufficient financial support. It is therefore with some regret—perhaps a sufficient explanation will be forthcoming at the meeting—that it is observed the decision arrived at last year that a special effort should be made to obtain annual contributions from gas undertakings to be devoted to investigation, research, and other purposes calculated to promote the interests of the gas industry, has only just been acted upon. The circular which has been sent out inviting subscriptions is dated as late as May 28; so that, unless there is some (at present to us masked) reason for delay, it seems that valuable time has been lost. The suggestion is that contributions should be calculated on a basis of (say) not more than 6d. per million cubic feet of gas made annually by the subscribing proprietors, or such other sum as may be considered suitable by them. With earnestness, we commend the proposal, and hope that the response will be as general as the good that must ensue from well-ordered research carried out under the supervision of special qualification. The matters that the Council have had under consideration, and in which they have rendered assistance in conjunction with other Technical Societies, are referred to. It would

however, have given greater publicity to the matter, if the experiments to determine the relative illuminating values of the Carcel, Hefner, and Pentane standards of light (seeing that they are completed) could have been reported upon at the forthcoming meeting, instead of having the vague hope expressed that a record of the results may be incorporated in the next volume of "Transactions." There is also a charge in the Special Purposes Fund regarding the "Suction Gas Experiments at Paris." A report on these experiments, with an indication of their lessons, would not have been unacceptable at the meeting, in the same way that the German Association present their reports on researches for which the funds of the Association are voted. Among other points of interest, it is noticed that the question of the long-felt necessity for obtaining an amendment of the Gas-Works Clauses Act has been referred to the Parliamentary Committee for consideration and report. In connection with last year's papers, it is observed that the honour of the London Gold Medal has been conferred upon Mr. J. H. Brown, the Institution Silver Medal upon Mr. W. Doig Gibb, and the Institution Bronze Medal upon Mr. John Bond. The effect of affiliation upon the membership is also noteworthy. Of the increase during the year, no less than 60 members and 3 associate members were enrolled under the special arrangements provided in the schemes of affiliation. That is an excellent result.

The Sulphur Restrictions Bill through Both Houses

THE Gas Companies' (Removal of Sulphur Restrictions) Bill has passed the House of Lords in practically the same form as it quitted the House of Commons. Certain amendments have been made in the Lords, but they are only modifications of detail in the schedule, and do not in any way affect the principle of the Bill. All the independent Bills, too, which contain clauses annulling the restrictive provisions as applied to the promoting Companies are also proceeding without any molestation on the part of the Local Authorities. This is very satisfactory; but the success is nothing more than was anticipated from the introduction of the Bills, in view of the clear and pronounced declaration and recommendation of Lord Rayleigh's Committee, as a result of their patient inquiry, and of the endorsement of their recommendation by Parliament in the session of 1905. It was amusing to see in the early part of this session how the preposterous attempt to organize hostile action—fomented some people think from Westminster—in connection with the Joint Bill crumbled away when the Local Authorities concerned grasped the true situation. The imposture of the ill-effects on health of gas from which a part of the sulphur compounds has not been removed was inflated until it burst, and showed that, like a soap bubble, there was nothing harmful inside. If the industry of gas supply in this country had exhibited hundreds of undertakings under the sulphur restrictions, and about four dozen free of them, the position would have been one which would have given the Local Authorities ground for asking that at any rate sympathetic consideration should be given to their representations against any change being made in a condition that was so nearly universal. But the boot being on the other leg; and the three or four dozen Companies working under this onerous restraint not showing that their consumers are, through the unnecessary refinement, even a little better off than the consumers in those towns where lime purification is not practised, the unreality of the ground of opposition to the divesting of the few from restriction is brought into striking relief.

But there is no occasion to re-open these matters. The main thing is that soon all those Companies who went to Parliament praying that what had been granted to London should be conceded to them will have obtained their desire. It is due to the Gas Companies' Protection Association that, in the gratification felt over the success, the initiative work they did in the promotion of the Joint Bill should not be overlooked. Had it not been for the Association, fourteen Companies (operating in more towns that that number represents) would have continued bearing the anxiety and nuisance of the system of purification required to lay low a few grains of sulphur compounds until such time as they happened to be in Parliament on their own account in connection with other matters. We make out, however, that there are still more than twenty Companies who are under the sulphur restrictions, and who for one reason or another did not join in the Bill this session. One of the reasons advanced was that the meeting of the Gas Companies' Protection Association from which the Joint Bill originated did not allow of sufficient time for decision before its promotion; and others we believe were frightened by the phantoms of their own imagination as to the evil that might befall their concerns if they crossed the Local Authorities in this matter. Local Authorities—the proceedings which cluster about the course of the present Joint Bill have shown—know little or nothing about this purely technical question; and against an invincible case only one authority, led or persuaded by officials, cared or dared to waste money in coming to Westminster with an opposing case formed by elements which were found to be absolutely incapable of concretion. That authority gained nothing; and they did not, as fanaticism it was quite on the cards might have induced them to do, appear a second time. But there are those remaining Companies. The passing of the Joint Bill this year is another blow to unreasonable control with unfettered competitors besetting on all sides. We therefore suggest that early consideration should be given to the question of co-operating with a view to the promotion of a similar Bill next year. Let there be a clean sweep of these legislative excrescences regarding sulphur compounds. There cannot be a better time for this than immediately after success.

Workmen's Compensation.

WHATEVER opinions may be entertained as to the character and tendency of the work of the Standing Committee on Law, there can be no question as to its thoroughness, and the earnestness with which the consideration of the Government measure is proceeding. Whether successful or not, the evident intention is to make a lasting settlement of this question, and as far removed from *dilettante* legislation as it is possible to conceive. Clause by clause, and almost line by line, the Bill is running the gauntlet of criticism—now from this side and now from that side—of so searching a character as almost to encourage the idea that it must finally emerge a perfect measure. But those who take this optimistic view really leave something out of account. Upon reflection, however, they cannot but perceive that what may be pleasing to one section of the Committee can hardly be otherwise than unsatisfactory to another section; and that (to put it plainly) the views of the predominating party can prevail only by a sacrifice of the interests of those who form the minority in the present Parliament.

It is quite evident, for example, that the reduction to three days of the period of non-liability for accidents must greatly increase the cost of compensation to all employers. This was pointed out some time ago by Sir Andrew Noble, who quoted the result of his own experience on this very point; and Mr. Hanbury Thomas, the General Manager and Secretary of the Sheffield United Gas Company, in a letter to "The Times" (given in the "JOURNAL" last week) supported a similar expression of opinion by reference to the experience of his Company for the seven-and-a-half years during which the present Act has been in force. In that period there have been 269 accidents recorded, of which only 121 have been cases where compensation has been paid owing to absence from work for more than fourteen days. Mr. Thomas, moreover, suggests the probability that, had payment been made earlier, a more prolonged absence in many cases might have resulted. He appears to think this the more likely, seeing that most Friendly Societies commence payment after three days. It is therefore quite conceivable that a workman receiving half wages, and at the same time his benefit from the Sick Society, might be getting as much as, or even more than, he would earn by returning to work; and in that case "the prospect of a few days' "holiday may prove too alluring for him to resist." That instances of this kind may occur, is indisputable; but, with all respect for Mr. Thomas, the possibility or even the certainty of such a result does not appear to be sufficient ground for withholding from workmen the compensation which may become their due. Is it not rather a reason, and a strong one, for making adequate provision for the prevention of fraud, in which the Friendly Societies are interested equally with the employers? Incidentally, it may be mentioned that Mr. Thomas confirms the figures recently given by Sir George Livesey, showing that workmen as they advance in years become, not more, as erroneously supposed, but less liable to accident. It may be pointed out, however, that Mr. Thomas gives only the percentage of accidents at various

ages, and not the numbers of men employed at these ages. He therefore fails to show the liability to accident of men at various ages. In order to get at this, it is necessary to have, in addition to the ages and the number of men who met with accidents, also the ages and the number of all the men employed.

A considerable part of one sitting of the Committee was recently taken up with the consideration of certain amendments proposed by the Government, the effect of which is to make more stringent the regulations with regard to contracting-out. These elicited the remonstrance that apparently the intention of the Government was to kill contracting-out by inches. However this may be, the impression prevails that the Labour members have scored in this as in other matters. Under the present Act, contracting-out is permitted where the Registrar of Friendly Societies certifies that any scheme is, on the whole, not less favourable to the general body of workmen and their dependants than the provisions of the Act. It is now proposed that, in any contracting-out scheme, the scales of compensation shall be not less favourable to the workmen and their dependants than the corresponding scales contained in the Act; that a majority (to be ascertained by ballot) of the workmen to whom the scheme is to be applicable shall be in favour of it; and also that the scheme shall contain provisions enabling a workman to withdraw from it. There is a commendable fairness in these proposals, so far as they go; but it is difficult to understand why, if a workman is to be allowed to withdraw from a contracting-out scheme, a majority should have the power of preventing a minority from entering into a scheme if they desire to do so.

On clause 4, relating to sub-contracting, the Labour members sought without success to relieve sub-contractors of all responsibility for accidents; and on the question of the inclusion of seamen, the Government have easily held their own. They have, in fact, done this against all proposals for restricting the scope of the Bill. It is only upon amendments extending its scope, and improving it from the point of view of the Labour Party, that they have had to give way. On clause 9, which applies the principle of compensation to industrial diseases, an interesting statement was made by Mr. Herbert Samuel, the Under-Secretary to the Home Office, as to the readiness with which the representatives of the large industries affected had accepted the proposals of the Government in regard to compensation for disease as well as for injury. The Bill provides that compensation shall not be payable in the event of persistent and wilful disobedience to regulations or special rules for the men's protection; but in the opinion of the legal members of the Committee, the sub-section dealing with this matter is more likely to encourage than avoid litigation. The Government therefore undertook to reconsider whether it should not be struck out. The case where a man was suspended suffering from lead-poisoning, and obtaining similar work elsewhere by giving a false name and saying he had never suffered from this complaint, was met by an amendment which encountered considerable opposition, and was only carried by a small majority. A great many amendments to this clause had still to be disposed of when the Committee adjourned for the holidays.

Responsibility for Restoration of Gas Trenches.

A CASE of considerable importance to the Metropolitan Gas Companies was recently decided in the King's Bench Division of the High Court of Justice, by Justices Kennedy and Bray, on an appeal from a decision of Mr. Emden, at the Lambeth County Court, last December, in the case of *Cressy and Wife v. South Metropolitan Gas Company*. The initial proceedings were reported in the "JOURNAL" at the time, and those on the appeal last week (p. 590). The action was brought against the defendant Company for damages for personal injury to Mrs. Cressy arising out of the alleged subsidence of a trench made by the Company, but filled in and restored by the Local Authority. Owing to some uncertainty as to who was liable—the Company or the Local Authority—correspondence took place, which caused such delay that the time within which an action could be brought against the Council had expired, so that the plaintiff had no remedy at all, if not from the Company. The learned Judge in the County Court decided, on the facts, in favour of the plaintiff, but held that the Company were not liable, on the ground that the Borough Council undertook the work by virtue of the powers conferred upon them by section 114 of the Metropolis Management Act, 1855, and thereby relieved the Company of the responsibility which otherwise would have devolved upon them under the provision of the Gas-Works Clauses Act, 1847. He however, assessed the damages at £22, with costs on the higher scale, in the event of his decision being reversed. Justice Kennedy, in giving his decision (without calling upon the defendants' Counsel), pointed out that the legislation of 1855 had this effect—that all that was prescribed in the Act of 1847 was subject to the Local Authority stepping in and doing the work, which they were entitled to do if they pleased, and charge the Company the cost. It could not be held that the Company remained liable for work which they were unable to do because the Local Authority had chosen to do it, and had done it in such a way as to cause the accident. He did not think any liability for the accident could justly be treated as falling on the defendants.

In this case it will be seen that the Local Authority were not in the position of mere contractors, as would have been the case had the Metropolis Management Act of 1855 not given them the power to take over the work. Under that Act, they became principals in the matter, and with the work took over all responsibility in connection with it. It frequently happens, however, that, by mutual arrangement, local authorities take over from gas companies the filling-in and restoration, at an agreed price, of the trenches made by the latter; and this course is, on many accounts, advantageous to both parties, provided reasonable terms are made. It does not follow, however, from the judgment just delivered, that in such a case the Company are thereby relieved from all responsibility in the event of accidents resulting from the work being negligently performed, though it is possible that they may have their remedy against the local authority as contractors. It is desirable that this should not be lost sight of in any arrangement of this kind, which, speaking generally, local authorities are greatly disposed to favour.

Liability for a Gas-Fitter's Negligence.

The Conservative candidates at the last Parliamentary Election at Oldham have been exceptionally unfortunate; for in addition to being defeated at the polls they have just suffered a second reverse in the County Court, over an action arising out of their campaign. The case raised an interesting point, as will be seen from the lengthy report which appears in our "Legal Intelligence" to-day; and it was as to which of three parties should suffer for the negligence of a gas-fitter's apprentice, as the result of which a serious explosion occurred. The Corporation, on request, connected the gas to premises hired by the candidates for election purposes; and on their inspector finding there was a leakage in the fittings, he turned off the gas at the meter, and told the tenants they ought to send for a plumber. This was done; and an authorized plumber sent his apprentice to put the matter right. This individual made no attempt to clear the room of gas; but when he had closed an open pipe-end in the ceiling (which had been the cause of the trouble), he asked a clerk in the employ of the tenants to hand him up a candle which he (the clerk) was holding in his hand. The gas had, of course, accumulated near the ceiling; and the raising of the candle was disastrous. The resulting explosion severely damaged adjacent premises belonging to the plaintiffs—the Oldham Brewery Company—who proceeded against both the Corporation and the tenants of the election-rooms. The argument against the Corporation was that there was negligence on the part of their inspector in leaving the gas connected at all, when he knew that there was a leakage. But, though evidence was given that, as a matter of practice, the Corporation servants did disconnect meters when they discovered a leakage, the Judge found that their failure to do so in this instance did not amount to negligence, and was not the approximate cause of the explosion. It is quite clear that the gas having been turned off at the meter, no explosion would have occurred had it not been subsequently turned on again; and so the Corporation could not be held to have done nothing to prevent the accident. This left the liability of the tenants to be considered; and in their case the Judge held that on more than one ground they should be held responsible. In the first place, the duty was cast upon them to see that the work was carried out with all "reasonable care and skill;" and they could not get rid of this

responsibility by delegating the duty to third persons. Secondly, "where a person, for his own purposes, brings on to his premises anything likely to do mischief if it escapes, he must keep it in at his peril." The Judge declared gas to be such a source of danger; and as it had not been "kept in" by the persons who, for their own purposes, brought it to their premises, he held them liable for the consequences. Next time there is an election, these candidates will probably request an authorized plumber to come himself and look after any escape of gas there may be at their committee-rooms.

Amended Home Office Memorandum on Water Gas.

In another part of the "JOURNAL" will be found the principal portions of an amended print of the memorandum prepared by Dr. Whitelegge, the Chief Inspector of Factories, on the use of water gas and other gases in industrial establishments—especially having regard to the danger of poisoning by carbon monoxide—which was issued by the Factory Department of the Home Office in the autumn of 1904, and was given in the "JOURNAL" at the time. In its main features, the memorandum stands as before; but there are certain additions which justify the reproduction of the portions affected, rather than a simple indication of the nature of the changes made. For example, in the first paragraph, suction gas is included among the gases likely to give rise to danger; in the third, the causes of casualties are increased in number; and so also are the preventive measures. The addition to these measures of any detail likely to tend to the preservation of the lives of those whose daily work is performed in an atmosphere which may at any moment become charged with some poisonous gas, is to be welcomed. Happily the oxygen cylinder has proved of inestimable value; and the instruction of workmen in its use, and in rendering first aid generally, has probably saved many lives which might otherwise have been lost. Rescue appliances, by the use of which the rescuer is enabled, in a poison-charged atmosphere, to breathe air, or a mixture of air and oxygen, are now kept in many chemical and other works; and prominence has lately been given to certain types of them which, as in the Courrières mining disaster, have been found exceedingly useful. The memorandum reiterates the importance, in towns where the percentage of water gas used is high, of great attention being paid to the gas-fittings in factories and workshops—a matter to which reference was made in the original document. On the whole, we have here evidence of the watchfulness of the Factory Department over the working conditions of the large army of labour in the country.

Mains in "Undedicated" Roads.

The imposition of a fine of £100 upon a Provincial Gas and Water Company, for neglecting to afford a supply of water, is happily so rare an occurrence that special attention may well be directed to the circumstances which led a Bench of Magistrates to come to the conclusion that they were justified in inflicting such a penalty. The Company concerned was the Rhymney and Aber Valleys Gas and Water Company, and a report of the case will be found in another column. Put shortly, the point for decision was whether the Company could be called upon to lay a main in a thoroughfare which had not been taken over by the Local Authority. The complainant, a builder, who was putting up some houses in a new street, was informed by the Company that his supply of water would have to be taken from the main in a street running diagonally at the back; there being no pipe in the front. This he agreed to do if the Company would bear the difference in cost; the length of pipe required for the back supply being much greater than that needed for the front. The Company declined to do this; and the houses were finished and ready for occupation by August last. However, they heard nothing about the water supply till December, when they were served with fourteen days' notice, under section 48 of the Water-Works Clauses Act, 1847, of the builder's intention to make the connection. In accordance with this notice, he proceeded to open trenches to his boundary wall; but he suddenly changed his mind, filled them up again, and served a notice upon the Company, accompanied by an agreement, as provided by the Act, to take a supply of water, and demanding the laying of a main. The Company refused to comply, on the ground that they had fulfilled their statutory obligations, and already had a main in a street upon which the applicant's property abutted. For this refusal they were convicted. The Company's case, as already mentioned, was that the street into which they were asked to go had not been dedicated to the public use; but the Bench held that, inasmuch as people were allowed to traverse it, it had virtually become a public thoroughfare, whether or not the Public Health Act or the Private Streets Improvement Act had been complied with. This is a ruling upon which it will be necessary to have the opinion of a Superior Court; and this, we understand, will be taken. It is not the cost of laying down a few yards of main that the Company object to; they want to know exactly how they stand in this matter. In one part of their district they are prevented by an estate owner from laying pipes at the request of builders under circumstances similar to those set forth above; while in another they are convicted for refusing to lay them. The position is an anomalous one.

The Struggles of New Company Vendors and Promoters.

Those who have a sufficient knowledge of gas and water affairs to save themselves being entrapped, and who, as shareholders, are being favoured with the attentions of the vendors of the Laindon and District Gaslight, Coke, and Water Company—the Water-Works, Lighting, and Power Investment Corporation, Limited—will be amused at their struggles to rake in the capital for which they are asking. Last week we exposed some of the claims of this concern to certain powers which they do not possess. In the financial columns of some of the daily papers on Wednesday, there appeared an announcement that the first batch of allotment letters had been posted. How dearly the promoters, vendors, contractors for certain work, and sellers of an "Act of Parliament for Gas and Water" which has no existence, must have desired that they could have said on Tuesday last that the whole of the allotment letters had been posted, and not only the first batch. We should have been interested in seeing the size of that batch. But as a matter of fact, shareholders in other companies were receiving at the beginning of last week further copies of the prospectus, with letters from the Water-Works, Lighting, and Power Investment Corporation, Limited, stating the pleasure it would give to these distributors of good things to "if possible" secure the recipient an allotment if he would be good enough—or would it not be better to say, foolish enough?—to forward his or her application on "the enclosed preferential application form." It is all too funny for words. Then after the announcement was published as to the first batch of allotment letters, shareholders in certain other companies were stirred up by another copy of the prospectus, with a letter enclosed dated May 25, but which at all events in one suburb of London was not delivered until Wednesday evening.

Guarantees and Preferential Allotments.

By that time the heading of the letter had been strengthened. From "*Re* Issue of Gas and Water Company's Debenture, Preference, and Ordinary Shares at Par," it had been converted to "Issue of Gas and Water Company's Debentures, Preference, and Guaranteed Dividend Ordinary Shares at Par." If the prospectus is consulted, it will be seen that the vendors guarantee 5 per cent. interest on the ordinary shares subscribed for in cash on this issue until the completion of an extension of the water-mains. The time occupied in making an extension of water-mains depends upon the extent of the work, and the number of men put upon it. The time may be anything (say) from a few hours to a week or two or perhaps a month. It is wonderful what can be done in a month in the way of main-laying; so that the guarantee ought not to cost the vendors much. Of course, the Water-Works, Lighting, and Power Investment Corporation, Limited (we wish the Company in choosing their name had had some consideration for those who would be called upon to use it), being "advisers upon all gas and water matters" know about these things as well as we do, but perhaps some of those to whom they address their prospectuses do not. Well, then, the letter received after the announcement as to the first batch of allotment letters having been posted says: "We commend the enclosed [that is to say, the prospectus] to your consideration." No doubt; the vendors, promoters and contractors being the "Corporation." Then, again: "We shall be pleased, *if possible*, to secure you an allotment if you will forward your application on the enclosed preferential application form by Friday morning next, when the

list closes." "If possible" and "preferential!" We wonder what this "Corporation" take gas and water investors to be? Is it likely that the Corporation would be wasting time, and money on printing and postage, if it were not "possible"? At the foot of the letter, applicants are invited to take notice that "holders of the present issue of shares and debentures will be entitled to a preferential allotment at par of any future issue." We have a notion that holders of the present issue of shares will not trouble to take advantage of this seductive offer.

"Water and Gas Securities Exchange, Limited."

Bearing upon this question of investments, two or three correspondents send us copies of a letter received from the concern boasting the above attractive title, and who had something to do with canvassing old gas shareholders for capital for the scheme which recently met with the disapproval of the Unopposed Bills Committee of the House of Commons. The letter states:

As we observe that you are interested in provincial water and gas shares or debentures, and having recently published a third edition of our book dealing with "Water and Gas Investments," we enclose short particulars [sample pages enclosed], and upon hearing from you shall be pleased to send a copy free of cost. In some cases, if averaging investments, we can arrange for an exchange of industrial or other kindred securities or mortgages, for water and gas progressive investments, to the advantage of investors.

One of our correspondents is a gas engineer of high rank in the profession; and to his epigrammatic inquiry "What do you think of this?" we may reply with equal terseness "Not much." The front page of the sample of the book is headed with a red-ink line "How to Increase Capital and Revenue." We have latterly become convinced that red signifies not only danger on railways, wharves, and so forth, but sometimes in prospectuses and elsewhere. After studying the "examples" contained in these sample sheets of how to increase income and capital, the conclusion is arrived at that the red-ink head-line might well be accompanied by another to something of this effect: "How to Depreciate Capital and Revenue." Because, although in big black type, it is stated that there are "600 sound water and gas investments," there are also a few unsound, over-capitalized concerns, whose dividends will not rise from (say) 2 or 3 per cent. to 10 per cent. or whose shares will not appreciate by (say) 185 per cent. in fifteen years as is necessary to bring these pretty schemes to maturity. It is a pity that those who are running this Securities Exchange should be so disinterestedly foolish as to give away to strangers their money-making ideas in this way. Why, it would better pay them to borrow money at a low rate of interest and net all the accruing benefits for themselves. To holders of securities in undertakings that have already progressed, and are firmly established, who may be tempted to exchange their holdings for "securities" in other undertakings that may or may not be so substantially progressive that their dividends will rise by 7 or 8 per cent. in fifteen years, we would say, "Look—and look well—before you leap."

A Prompt Gasholder Conversion.

Messrs. Clayton, Son, and Co., of Hunslet, have lately completed, with promptitude that has given the greatest satisfaction, a contract for the conversion of a single-lift gasholder, 80 feet diameter by 20 feet deep, into a four-lift one. The work was carried out for the Long Eaton Gas Company, under the supervision of the Engineer, Mr. G. Stevenson; and as it was vitally important to the Company that the job should be completed, and the holder ready for use, not later than June 15, a time-penalty clause was inserted in the contract, and a proportionate bonus was offered for every week the work was completed before this date. Messrs. Clayton commenced operations on March 11; and on May 11 the holder was ready for receiving gas—the alterations from start to finish having taken two months. Both parties are therefore well satisfied—the Company are highly pleased with the dispatch and workmanship, while Messrs. Clayton have a bonus to their credit. It may be mentioned that the inner lift of the holder rises above the guide-framing, without the aid of wire ropes or spiral guides.

Fusing of Electric Wires Causes a Gas Explosion.—In Argyle Place, Regent Street, yesterday week, passers-by were startled to see the cover of an electric cable box suddenly dislodged and a dense volume of smoke and flames issue from the cavity. The explanation was that the fusing of some electric wires had caused a gas explosion. The firemen experienced some difficulty in getting at the main; but, after half-an-hour's work the flames were, with the assistance of the Gas Company's officials, extinguished.

INSTITUTION OF GAS ENGINEERS.

Programme for the Annual Meeting.

In a previous issue of the "JOURNAL," a general indication was given of the arrangements made for the forthcoming annual meeting of the Institution of Gas Engineers, which will be held at the Institution of Mechanical Engineers, Storey's Gate, Westminster, from the 19th to the 21st inst., under the presidency of Mr. CHARLES WOOD, F.C.S., the Gas Engineer and Manager to the Corporation of Bradford. We are now able, from the programme which has been issued, to give fuller particulars in regard to the meeting.

On the opening day, the chair will, as usual, be taken at half-past ten, and among the first business will be the appointment of Scrutineers to examine the ballot-papers for the election of officers and members of the Council for the ensuing year, and the presentation of the annual report and statement of accounts, the London Medal, and the other medals awarded for papers read last year. Then will come the President's Inaugural Address; and, should there be time, a commencement will be made with the technical portion of the business. Readers have already been made acquainted with the nature of the communications to come before the members. The following is a complete list:—

"The Fiddes-Aldridge Stoking Machinery at the Wavertree Works, Liverpool." By Mr. EDWARD ALLEN, of Liverpool.

"Associated Management of Gas Undertakings." By Mr. R. BRUCE ANDERSON, of Westminster.

"Notes on the Argand Burner." By Mr. CHARLES CARPENTER, of London.

"The Legal Relations existing between Road Authorities and Gas Undertakings." By Mr. FRANCIS T. COTTON, of Dublin.

"The Retorting or Carbonization of Coal." By Mr. THOS. GLOVER, of Norwich.

"The Vertical Retort from a Practical Point of View." By Mr. ERNEST KÖRTING, of Berlin.

"Carburetted Water Gas for Small Gas Undertakings." By Mr. JOHN LYNE, of Wexford.

On Wednesday, the chair will be taken at ten o'clock; and the attention of the members will be first directed to the Benevolent Fund of the Institution, the annual report and accounts of which will be presented, and two members of the Committee of Management elected to succeed those retiring. After this business has been disposed of, the reading and discussion of papers will be resumed. In the evening, the members will be invited by the President and Mrs. Wood to a reception and dance at the galleries of the Royal Institute of Painters in Water Colours, Piccadilly, where the pictures of the Pastel Society will be on view.

On Thursday, the rest of the technical business will be dealt with, and the result of the election of officers and members will be announced. A feature of interest in connection with the closing proceedings at these gatherings is the fixing of a place of meeting for the ensuing year; and this time the members will be asked to consider a proposal to visit the Irish International Exhibition to be held in Dublin.

On Friday, there will be an excursion to Boulogne; and, should the weather be favourable, the run across the Channel ought to prove enjoyable. By the courtesy of the town authorities of Boulogne, members will be admitted to the concert hall, facing the sea, on producing their membership cards. The restaurant at the Gare Maritime will afford ample accommodation for luncheon and tea; and the steamboat and train service will enable the members to reach town shortly before eleven.

It is intimated that the members will have at their disposal the afternoons of the days of meeting; and as probably they will be desirous of utilizing the time to the best advantage from a professional standpoint, they will doubtless avail themselves of the opportunity which will be afforded them of visiting the various works of the three London Gas Companies, which, by the courtesy of the Directors, will be open for inspection at half-past three each day. In order that suitable arrangements may be made, the members are requested to notify to the Secretary of the Institution (Mr. Walter T. Dunn) which works they wish to see.

Annual Report of the Council.

The Council present the following as their report on the work of the Institution during the past year.

Dealing first with statistics of membership, it will be seen from the table below that the total number of members at the end of the year 1905 was 812, as against 740 for the preceding year—an increase of 72.

During the year, seventy-three members and twelve associate members (three of whom were previously students), have been elected, and four students admitted. Six associate members have been transferred to the class of member, and one associate transferred to the class of associate member.

Under the special arrangements providing for the admission to the Institution of members of the six affiliated Associations, sixty

members and three associate members were elected, the numbers being included in the following figures:—

Class of Member.	At Dec. 31, 1904.	Elected and Transferred during 1905.	Deceased, Transferred, &c., during 1905.	At Dec. 31, 1905.	Increase.
Honorary members .	24	..	1	23	−1
Members	612	79	12	679	67
Associate members .	91	13	6	98	7
Associates	1	..	1	..	−1
Students	12	4	4	12	..
Totals	740	96	24	812	72

The Council regret to record the decease of the following members since the publication of their last report:—

James Beck	Stamford.
George Bray.	Leeds.
William Carpenter	Sheerness.
John Davies	Nantwich.
Andrew Dougall, sen.	Hull.
Robert Peake Keys	London.
James M'Gilchrist	Dumbarton.
Samuel Stewart	late of Greenock.

Annual General Meeting.—Under the presidency of Mr. Daniel Irving, of Bristol, the annual general meeting of 1905 was held on the 30th and 31st of May, and the 1st of June, at the Institution of Mechanical Engineers, Westminster. The three medals which were offered in connection with the papers read have been awarded as follows:—

1st. The London gold medal to Mr. J. H. Brown, of Nottingham, for his paper describing "Experiments with Low-Grade Mixed Gases."

2nd. The Institution silver medal to Mr. W. Doig Gibb, of Newcastle-on-Tyne, for his contribution "Notes on Structural Engineering."

3rd. The Institution bronze medal to Mr. John Bond, of Southport, for his paper on "Pyrometers and Carbonization."

The President and Mrs. Irving gave a reception at the Galleries of the Royal Institute of Painters in Water Colours, on the Wednesday evening. On the Friday, a visit to Hastings was enjoyed, including an inspection of the new works of the Hastings and St. Leonards Gas Company.

Legislation re Gas-Testing in the Metropolis.—In connection with this highly important matter, the Council, in following up their action recorded in the last report, prepared a petition which was presented on their behalf to the House of Lords Committee. Evidence representing the views of the Institution was also given before the Committee. [The text of the petition is fully set out.] The members will have observed with satisfaction that the result of the determined opposition to the proposed use of the "London" argand burner with a fixed rate of consumption, has been the adoption of a new testing burner (the invention of Mr. Charles Carpenter), with adjustable air supply, which does equal justice to all qualities of "common" gas, and consequently secures what has been so greatly desired—viz., uniformity in testing.

Home Office Inquiry re Working of Sidings.—Another important matter that has engaged the attention of the Council during the past year has been the Home Office inquiry into the objections lodged against the proposed regulations under the Factory Acts, affecting the use of railway waggons and locomotives on private sidings. As originally drafted, these regulations contained various irksome and unnecessary provisions; but as the result of the inquiry, at which the Institution was represented by Counsel, practically all the objections raised on behalf of the gas industry were satisfactorily met.

Engineering Standards Committee.—Mr. Charles Hunt and Mr. Charles Carpenter, representatives of the Institution on the Engineering Standards Committee, to whom the question of the standardization of flanges of gas-pipes, valves, &c., was referred, have reported to the Committee.

Education and Training of Engineers.—A Special Committee on the Education and Training of Engineers was appointed by the Institution of Civil Engineers in November, 1903, under the following terms of reference:—

"To consider and report . . . as to the best methods of training for all classes of engineers, including both scholastic and subsequent technical education; it being an instruction to this Committee that the principle shall be maintained that the education of an engineer must include both practical experience and scientific training."

The Institution of Gas Engineers was represented on this Committee by Mr. Harry E. Jones, and has now completed its work. Copies of its valuable report and recommendations duly adopted have been received.* The thanks of the Council of the Institution of Civil Engineers for the assistance which the Committee has received from the Institution of Gas Engineers in the prosecution of the inquiry, and especially for the co-operation of its representative, Mr. Jones, have been communicated by the Chairman of the Committee, Sir W. H. White.

* See "JOURNAL" for May 1, p. 289.

Amendment of the Conferences Act.—Further progress has been made by the Council with the movement seeking to amend the Public Health and Local Government Conferences Act of 1885, so that the expenses incurred by members in the service of local authorities in attending the meetings of the Institution may be allowed. In connection with this, the Council have appointed Mr. John Carter and Mr. Octavius Thomas as delegates of the Institution in conjunction with several other Technical Societies, the members of which are also affected, with a view to a strong appeal being made to the Local Government Board with regard to the desired amendment.

International Photometric Committee.—A French and a German edition having been published, arrangements have been made for translating the report of the International Photometric Committee's meeting at Zurich, and printing it for insertion in the next volume of the "Transactions."

Comparisons of Standards of Light.—The experiments carried out for the Institution at the National Physical Laboratory to determine the relative illuminating values of the carcel, hefner, and pentane standards of light have been completed, and the Council hope to include in the next volume of the "Transactions" a record of the results which have been obtained.

International Gas Exhibition.—In commenting on the successful gas exhibition at Earl's Court, reference was made in the Council's last report to the financial assistance accorded by a large number of gas undertakings. Since then, the accounts have been made up showing a balance remaining of £399 7s. 10d. The contributors have readily consented to this surplus being devoted to the fund which the Institution is establishing for the purpose of investigation and research; and the amount has accordingly been placed to the credit of the "Special Purposes Fund."

Engineering and Machinery Exhibition, 1906.—In response to an invitation to appoint two representatives of the Institution to serve upon the Advisory Committee of the Engineering and Machinery Exhibition which is to be held in London from the 15th of September to the 17th of October next, the Council nominated Mr. Daniel Irving and Mr. J. W. Helps.

Dr. Perkin's Jubilee.—As this year the jubilee occurs of the coal-tar colour industry, the foundation of which was laid by Dr. William Henry Perkin, in the discovery of the dye stuff "mauve," preparations are in progress among various Societies at home and abroad for suitably celebrating the occasion. The Council feeling it desirable that the Institution should be identified with the movement, are preparing an address of congratulation for presentation to Dr. Perkin, who, it is interesting to recall, is associated with the Institution as the recipient of the Birmingham Medal in 1892.

Special Purposes Fund.—In accordance with the decision arrived at last year, a circular (of which a copy is given below) has been issued to all gas undertakings in the United Kingdom, asking for annual contributions towards a fund to be used in connection with investigation, research, and other special purposes calculated to promote the interests of the gas industry. A copy of the report on the subject, which was adopted by the Institution, accompanied the circular; and it is hoped that the result will be to place at the disposal of the Council the means for dealing with questions of special importance in connection with the extended use of gas.

Dear Sir,—The Council and members of the Institution of Gas Engineers are naturally desirous of using their powers in all possible directions calculated to improve the position of the industry of gas manufacture and supply which that body represents. They are, however, hampered by the fact that, while the subscriptions of the members are sufficient to meet the ordinary expenses of administration and the dissemination in many ways of much valuable information, they do not, even when supplemented by the amount already subscribed by some gas undertakings, provide the funds necessary to enable them to carry out the investigation of many matters, fuller information upon which would, they are assured, greatly benefit the industry.

The Council have from time to time given this subject very serious consideration, and at the last annual meeting they presented a report thereon which was unanimously adopted by the members, and a copy of which I beg to enclose herewith.

In this report, it is pointed out that as those who will chiefly benefit by the result of such work must be gas undertakings generally, it is only natural that to the owners of such undertakings the Institution should look for the funds which will be required.

In furtherance of this view, an appeal is now made to all gas undertakings in the United Kingdom for annual contributions to a proposed Investigation Fund; and it is suggested that such contributions should be calculated on a basis of (say) not more than 6d. per million cubic feet of gas made annually by the subscribing proprietors, or of such other sum as may be considered suitable by them.

The character of the work which such a fund would enable the Institution to carry out is indicated below; while other subjects would be treated in proportion to the measure of support accorded to the scheme.

The hygiene of gas as a lighting and heating agent.
Difficulties due to naphthalene.
Experiments showing the advantages of gas for light, heat, power, and ventilation.
Parliamentary requirements in regard to standards of light, &c.
Distribution of gas at high pressure.
Improvements in the methods of manufacture, purification, and distribution.
Legislation affecting gas undertakings.
Tests of new appliances and methods tending to increase the sale of gas.

I may mention that during the past twelve months or so the Institution has taken a prominent share in two very important matters affecting the interests of the industry, and I am glad to say with very successful results.

One of these related to the method of testing for illuminating power, in regard to which the Council joined with the London Companies in their objection to the proposed use of the "London" argand burner with a fixed rate of consumption. In the result, a new testing-burner (the invention of Mr. C. Carpenter), with adjustable air supply, has been prescribed, which does equal justice to all qualities of "common" gas, and consequently secures what has been so greatly desired—viz., uniformity of testing.

The other matter relates to the inquiry ordered by the Home Office into the objections lodged against the proposed regulations under the Factory Acts affecting the use of railway waggons and locomotives on private sidings. As originally drafted, these regulations contained various irksome and unnecessary provisions; but as the result of the inquiry, at which the Institution was represented by Counsel, practically all the objections raised on behalf of the gas industry were satisfactorily met.

The Council trust that your Board (or Committee) will appreciate the great importance of the work which the Institution has undertaken, and will assist their efforts in accordance with the proposals referred to above, and by offering any further suggestions which may occur to them.—I am, &c.,

(Signed) WALTER T. DUNN, *Secretary*.

Delegates at Conferences.—During the year representatives of the Institution were appointed to attend the conference of the Royal Institute of Public Health in London, the Smoke Abatement Joint Conference in connection with the Royal Sanitary Institute, and the forthcoming annual congress of the Royal Sanitary Institute, which is to be held at Bristol.

Examinations in Gas Manufacture.—The attention of the Council has been drawn by the present Examiner to the desirability of the Institution being invited to assist in the nomination of the Examiner in the subject of gas manufacture under the City and Guilds of London Institute, Department of Technology. Appreciating the value of the suggestion, correspondence is now proceeding on the matter, which it is hoped will be satisfactorily arranged.

Gas-Works Clauses Acts.—The question of the expediency of taking steps for obtaining an amendment of the Gas-Works Clauses Acts has been brought before the Council, and referred to the Parliamentary Committee for consideration and report.

Library.—The Council wish to take this opportunity of expressing their thanks to those who during the past year have made presentations to the library, a list of which will be found appended, and would remind members that works of interest to gas engineers are at all times acceptable.

Accounts.—A copy of the balance-sheet and accounts for the year ended the 31st of December, 1905, is also appended—duly certified by the appointed Auditors, Mr. J. L. Chapman and Messrs. Wood, Drew, and Co.

CHAS. WOOD, President.
WALTER T. DUNN, Secretary.

NOTES FROM WESTMINSTER.

IT has been a light week, as our over-wrought legislators relinquished work on Thursday for the Whitsuntide recess. Excellent progress is, however, being made with Bills. Some of them, in fact, have thus early attained the dignity of Acts; Royal Assent having been accorded a batch, which contained the Kidderminster, the Mirfield, the Thornton, the Accrington, and the Carlisle Gas and Water Bllls The Removal of Sulphur Restrictions Bill, too, is now awaiting Royal Assent. A Lords Committee has been selected for June 26 to take into consideration a few Gas Bills. Regarding the remarks in last week's "Notes" as to the gas lands required by the London Outer Circle Railway, there is a prospect of an arrangement being arrived at between the Brentford Gas Company and the promoters, respecting the land proposed to be substituted for that required at Southall by the Railway Company. It is not anticipated there will be any difficulty in getting the necessary manufacturing powers for it. The line, it also appears, may prove a blessing to other gas-works—for example, those of the Ilford Gas Company. Mr. Alex. Johnston, the Engineer, has informed the Commons Committee who are considering the Bill, that his Company have made an arrangement with the promoters for sidings which, it is estimated, will result in a saving of 9d. per ton of coal delivered.

Power Gas and 13-candle Illuminating Gas.

The spreading desire of Gas Companies to be authorized to supply power gas has been, within the past week or two, referred to in the Committee rooms in connection with unopposed measures—the Truro Gas Bill being a case in point. This was before Lord Onslow on Tuesday last; and it was soon made manifest the fact that there was no specified limitation to the percentage of carbon monoxide that the power gas may contain had not escaped the Lord Chairman's attention. The Home Office, it appears from the report published elsewhere, and from the hints thrown out in connection with the Bills in which authorization is sought to supply power gas, is keeping an eye on this question. But in the case of the Truro and the Tottenham Bills, the Department has been fully satisfied by clauses which will bring the trading in power gas under any regulations which the Home Secretary may make, or under any General Act dealing with the matter which may be passed. Under the Truro Bill, which has been reported for third reading, the Company will have power to supply for ordinary purposes 13-candle gas. A clause, giving the Corporation the option of purchase over seven years without opposition other than in respect of details, now appears in the Bill.

L.C.C. Bill—Gas Companies' Opposition.

Two sittings last week were as many as the Hybrid Committee on the London County Council Electricity Bill could manage; and then they adjourned to June 12. Borough Councils came one after the other in opposition to the County Council being allowed the extraordinary powers now sought; and the Middlesex Council and the Westminster City Council offered stern protests against the project. If the Committee pass the Bill, it will show that this inquiry has been a farce all through; for never was Bill subjected on all hands to such hostility, and never has Bill dealing with such large interests had such meagre outside support. The opponents also asked, if the Bill was allowed to proceed, that all clauses should be struck out which would permit the Council to compete with existing distributors; and the strongest resistance has been made to the impertinent proposal that the Council should have the right of applying for a reduction in the scheduled prices of the current supplied by other authorized suppliers. The Council have tried to mollify the opposition; and have offered to amend the revision clause so that it shall not operate for five years after the passing of the Act, and to give authorized distributors the reciprocal right of applying for a revision of County Council prices. The Council have also undertaken to be placed under an obligation to supply authorized distributors. The distributors, however, do not want the Council at all; for as light is being let on to the situation, they find that the Administrative Company last year were willing to enter into agreements at lower prices than those at which the Council will be able to afford to supply. Before the Committee adjourned on Tuesday, Mr. R. Neville addressed the Committee on behalf of the Gaslight and Coke Company, the South Metropolitan Gas Company, the Commercial Gas Company, and the Brentford Gas Company, who were opposing as ratepayers. In the London area, the learned Counsel said, the Gas Companies paid about £400,000 a year in rates; and of the 2s. 11d. per 1000 cubic feet charged to consumers by the Gaslight and Coke Company, 3d. was due to rates. He strongly protested against Gas Companies being subjected to competition backed by the rates; and at the same time being placed under the liability to make good, by increased rates, the losses incurred in this way.

Presentations to Mr. James W. Helps.

In noticing the latest happy incidents in the long connection which Mr. James W. Helps has had with the Croydon Gas Company, we cannot refrain from introducing them by offering to him our warmest congratulations on the event of the present week. Our sincere hope is, and it is a hope that will be endorsed in the heart of every man in the gas profession, that upon Mr. Helps and the lady who will in future share his joys and sorrows, may descend that health, peacefulness, and prosperity that will contribute to the joys of life and lighten the sorrows when (we trust rarely) they come, as they must come to each one of us. This brief reference is not the measure of our heartfelt wishes; its brevity is out of respect for the desire of Mr. Helps for as little publicity as possible.

At a meeting of the Directors of the Croydon Gas Company on Friday afternoon, the Chairman (Mr. Charles Hussey, J.P.), on behalf of himself and his colleagues, presented to Mr. Helps a handsome oak canteen, containing a complete set of forks, spoons, &c. A plate was attached, bearing the following inscription: "Presented to J. W. Helps, Esq., M.Inst.C.E., by his friends the Directors of the Croydon Gas Company, on the occasion of his wedding. June 7th, 1906."

By invitation, Mr. Helps was present at a meeting of the Company's staff and workmen, at the gas-works, Waddon, the same evening. Mr. W. W. Topley, the Secretary of the Company, occupied the chair; and was supported by, among others, Mr. Archd. Caddick, the Assistant-Engineer. A great deal of enthusiasm was manifested by the men; and, by a happy thought, it was the oldest employee of the Company (Mr. T. Shadbolt) who was called upon to make a presentation to Mr. Helps which, in its beauty, reflects both the solid respect and fine feelings which staff and men possess for their chief. It was a handsome china cabinet that it was Mr. Shadbolt's pleasing duty to hand over to the keeping of Mr. Helps. To the inside of it a silver plate is affixed, which bears the following inscription: "Presented to James W. Helps, Esq., M.Inst.C.E., on the occasion of his marriage, as a mark of respect and esteem, by the employees of the Croydon Gas Company. June 7th, 1906."

GAS STOCK AND SHARE MARKET.

(For Stock and Share List, see p. 656.)

It is not often that we find in one week such a combination of influences and factors all calculated to impede business and reduce it to its lowest denomination as those which were concentrated in the week just closed; and for result Stock Exchange business was almost "cut off at the main." It was account week, and a long account too; it was Epsom Summer Meeting week; Wednesday and Thursday were solemn Jewish festival days; Wednesday was a New York holiday of minor solemnity; and on Saturday the feast of Whitsuntide began. Truly there was not much time to spare for business. But quiet as things were, there was no undue depression; and the markets kept very cheery—marking time (if they could mark little else) until there should be a revival. In the Money Market, there was more interest; for in addition to the requirements of the Stock Exchange, the close of the month brought the usual seasonable demand, and rates both for short loans and for discount ruled firm. Business in the Gas Market was fairly good, considering the circumstances; and the ruling tendency was favourable. What few changes in quotations did take place were in the upward direction. In another month, the half year will be complete; and we may begin to forecast what sort of a season it will have been for the gas industry. Except in those quarters where there has been room for expansion of business by automatic supplies and otherwise, the expectation may be moderate. The weather has not been wholly propitious, at least in the Metropolitan latitude, for we had our warm weather when the days were short, and our cold when they were long. The week's operations show that in Gaslight and Coke issues the ordinary was moderately and steadily done at figures which ranged only from 97¼ to 98¼—that is, about the same as in the week before. The secured issues were lightly touched. The maximum changed hands at 88¼; the preference at 110; and the debenture at from 86 to 87½, with a disposition to advance. South Metropolitan was very quiet, and was done at from 128 to 128¾. In Commercials, there was nothing beyond one transaction in the 3¼ per cent. at 112. The Suburban and Provincial group was quite inactive. Brighton ordinary was done at from 165¼ to 167, and that was all. Wandsworth debenture advanced a point, after a quantity had been successfully placed at the Mart. In the Continental Companies, Imperial was firm, and changed hands at from 176½ to 178½—a rise of 1 in the quotation. European fully-paid marked 24½ (a rise of ½ in the quotation), and ditto part-paid 18⅝ and 18 11/16. In Union, there were no transactions. Among the undertakings of the remoter world, Buenos Ayres was done at 12 3/16 and 12⅜, Primitiva ordinary at from 6½ to 6¾, River Plate at from 12 7/16 to 12⅞, San Paulo at 14, and Melbourne 4½ per cent. at 103.

The closing prices are shown in our Stock and Share List on page 656.

ELECTRIC LIGHTING MEMORANDA.

The Necessity for Encouraging Business in the Electrical Industry—Differential Prices and General Reductions for Lighting and A Power—Long-Hour Power Users not Attracted at Liverpool—Questionable Concession to New Consumers at Dublin—The Free-Wiring Bubble Pricked—The Evil that Generating-Stations Do.

Throughout the country of late, there has been in municipal chambers much talking over the question of the charges for electrical energy; and it may be taken that what has transpired through the publicity given to municipal proceedings is only a reflection of what has been taking place in the secrecy of Board rooms. In most quarters discussion has ended in all-round reduction of charges. This is a matter of which in each town due note will be made by those responsible for the gas supply; and it will also be remarked that a great deal of attention is being paid to the value of different classes of consumers. How times have changed since the period when many gas suppliers, in the enjoyment of the monopoly of a systematized service for lighting and industrial purposes, regarded with supreme indifference the question of differential rates! Differential rates are now the handmaids whose services are welcomed to retain and extend business in competition with others. Gas was first in the field; electricity, being second, is therefore the attacking force. And those who are on the defensive, no matter how strong may be their position, cannot, in their own interests, suffer the methods of their attackers to go unnoticed; for it is their methods that require to be frustrated. If the reports of proceedings in Council meetings are read with care, it will be observed there are three things that have produced this recent pronounced revival of the consideration of charges for electricity. It is not in all cases that local authorities can really afford to reduce their charges, but they are impelled to it by the sheer force of necessity. In the first place, many electrical departments have already reached a stage where they find progress becomes more arduous, and their old nostrums for curing sluggishness are not proving effectual. New connections are not coming on at the rate that is necessary to give the business a better financial appearance; while, coincidentally with this condition, one by one the managements are being converted, by what is yearly becoming more and more uncomfortably obvious, to the belief that the cynicism of the past regarding reserve and depreciation funds was all a mistake. They have learnt also by their previous experience the power of reductions to give a fillip to business. In the second place, they have discovered that previous reductions have not been sufficient to stop the grumblings of consumers as to the amount of their accounts. A grumbling consumer is a bad advertisement; and something has to be done to assuage discontent. In the third place, it is found that gas is a doughty rival, and one with the objectionable habit of seeking to regain that which has been lost. But, however strong the position of gas, we repeat that the methods of the rival must be kept well in view. Those methods just now are further reductions all round, and a widening of favour in respect of prices according to the value of the consumer.

A brief examination may be made of examples of the consideration that is being given to this question of electricity prices. There has been controversy on the subject both in the Liverpool Press and in the City Chamber; a new scale of charges that the Electrical Engineer (Mr. A. B. Holmes) devised, which scale has been adopted, having provoked it. His report brings out a point that is rather valuable, coming as it does from a city of such magnitude as Liverpool. He asserts that an experimental reduction of the minimum rate for power purposes of from 1½d. to 1d. per unit made last April has failed to attract any large long-hour users; and he considers that for short-hour users this reduced rate is unremunerative. That is a bad look-out. Suction gas has hit electricity hard; and so has the prudent (where conditions will allow) reduction for considerable users of town's gas to, say, 1s. 6d. or 1s. 8d. per 1000 cubic feet, which are generally recognized as the prices that fairly compete with suction gas—all costs appertaining to the installation of the latter being considered. There are, it is fully admitted, certain operations of an intermittent character, for which electricity is a most convenient motive power. We may even instance the intermittent work connected with the charging and the discharging of gas-retorts. However, at Liverpool the charges have been revised for power to: 2d. per unit up to 3000 units per quarter; 1½d. above 3000 and up to 10,000 units; and 1d. for any excess. For lighting, the new figures are: 3½d. per unit up to 3000 units per quarter; 3d. from 3000 units to 10,000 units per quarter; and 2½d. beyond. These are prices at which, with incandescent gas lighting, the gas industry can afford to smile. But still there is a reduction of a farthing per unit to the small consumer; and even a farthing has a recommending influence just as 1d. has on the price of 1000 cubic feet of gas. There has been some agitation for a greater reduction for power purposes; but the Corporation have not thought fit to comply, though they have been told that "it is obvious development must be in the purchase of power and not of light." If this is true, the future of electricity undertakings does not look brilliantly promising. The Corporation have, however, in the face of the protest raised against them going into competition with trading ratepayers, decided to take up the hire-purchase system for motors on a five years' basis.

If we turn to Dublin, it is found that recently the Corporation have determined on a general reduction, extending not only to the various purposes for which electricity is required but to the meter-rents, and to the charge to consumers of only one-half the rates during the first six months of installation. This, of course, is an advertisement, and is a sop to people to abandon their gas-fittings and to get electrical ones installed. There is a little assumed artlessness about this. There have been suggestions that, in order to get fresh custom, the Lighting Committee should allow abatements to new consumers so as to relieve them of the actual cost of wiring their premises. The Committee, however, find that the conditions of their Electric Lighting Order hamper them in this direction. The pretext for allowing half-price electricity for six months, is that "a certain waste of electricity by a consumer inevitably occurs during the early periods of an installation by reason of trials of fittings, &c." As a matter of fact, the plan resolves itself into assisted wiring by the Corporation. The legality of a free supply of electricity by a local authority for a period so as to gain new custom has before been questioned elsewhere; and notwithstanding the opinion of the Law Clerk to the Corporation of Dublin, we should advise the Gas Company, as ratepayers, to take Counsel's opinion upon the point. We cannot see any difference between giving a free supply of electricity for three months and charging half price for six months. As to the revised tariff. The price for power on the maximum demand system is to be 3d. per unit for an equivalent of the first hour's use per day throughout a quarter, and 1d. per unit for all consumption beyond, with an alternative flat-rate of 1¾d. per unit. A basis of guarantee for small-power consumers has also been adopted, by which the cost of electrical energy will not exceed 7d. per day per horse power installed. Then for factories using over 3000 units, for power, a flat-rate of 1½d. per unit has been adopted, and for over 5000 units, 1⅜d. Newspaper offices are to be supplied at a flat-rate of 1¼d. For the lighting of churches, concert halls, and theatres, special terms have also been allowed; and meter-rents generally have been lowered.

In Edinburgh, electricity for private lighting has been reduced from 3¼d. to 3d. per unit, and for motive power from 1¼d. to 1⅛d. Returning to England, Bedford has come down lower than Edinburgh in the charge for power and heating—viz., from 1½d. to 1d.; and the charge for public lighting is to be the actual

cost of production. Perhaps the Bedford Corporation have not heard that in more populous and industrially active Liverpool, 1d. per unit for power "has failed to attract any large long-hour users, and that this reduced rate is unremunerative for short-hour users." The question of charges has also been discussed at Cardiff; and there has been a reduction. The price, under the maximum demand system, will now be 7d. and 2d., with a flat-rate of 3½d. The reduction is equal to 22½ per cent., and will represent £2721 a year. As the "net profit" of the department last year was only £1588, and as there has been a fairly large amount of capital expended lately, perhaps we may be pardoned for thinking that the Electricity Committee and their Engineer have too generous a belief in the recuperative power of the undertaking. The staff of the Department will have to sharpen up their wits, seeing that, in addition to their own loss and the increased capital responsibilities, the price of gas has been reduced. It was announced in the Council, during the discussion on the new scale of electricity charges, that many houses in which electricity has been used are now returning to gas. The Electrical Engineer is consoling himself that his new prices will compete with gas. They might, with gas used in flat-flame burners, but not with gas used in incandescent ones. Turning to Chester, it is found there that the price has been dropped from 4d. to 3½d. per unit; and motive power rates from 2d. to 1½d. per unit for the first 200 units per quarter, and 1d. per unit for all current consumed above 200 units. In view of this, the Tramways Committee are grumbling at the 1¾d. per unit they pay, including the cost of the maintenance of the overhead equipment, which amounts, it is reported, to only £100 a year! There is danger of complaint now from those who do not privately use electricity, but who have to pay heavier for public lighting than would be necessary if electricity had not been adopted. There has been a little murmuring over this already in the Council; and it is not long ago that there were more than murmurings heard in the old city. The Cheltenham Electric Lighting Committee have taken to heart—as have nearly every other Electric Lighting Committee throughout the country—the complaint of the consumers that they cannot understand the involved maximum demand system of charging; and the Electrical Engineer has evolved a new system of paying, by which 5½d. per unit will be charged for the first 125 hours' maximum demand per quarter, 4d. per unit for the next 125 hours' demand, and 2d. per unit for all additional current, with 5 per cent. discount. Perhaps the meaning of this, too, will not be so transparent to the consumers, as it is to the Electrical Engineer. It may suit the long-hour users; but long-hour users are not all large consumers. And how will the large consumers (all of whom may not be long-hour users) benefit? The prices are far too steep to encourage lighting business. For power a flat-rate of 2d. is to be the charge; but power requirements are not a strong point of the Cheltenham electricity business. Worcester has also adopted the flat-rate.

These are sufficient examples to show the trend of electricity prices in provincial cities and towns. Low price, it seems to be generally agreed, is the best method by which to encourage the electricity business. The electricians' delusion and the consumers' snare—the maximum demand system—has not worked the wonders that was expected of it; and now the free-wiring bubble has been pricked. The Brighton Corporation recently passed a resolution asking the Municipal Electrical Association to consider the advisability of requesting the President of the Board of Trade to introduce a Bill into Parliament to authorize corporations to carry on the business of wiring consumers' premises. Brighton has been long enchanted by the free-wiring system; but the resolution referred to above had hardly had time to cool when the Corporation resolved to take no further steps towards obtaining powers to wire consumers' premises "on the ground that such powers have been found to be practically useless elsewhere." Free-wiring is a highly speculative business; and it is quite true that experience has proved that its advantages have been over-rated. Trading in electrical fittings, in pushing business, has brought the Sheffield Corporation into litigation with the Contractors' Association; and there are now complaints at Liverpool as to unfair undercutting by the Electricity Department—one instance being quoted in which the price charged could not have paid the wages of the men employed. It is doubtful whether the Liverpool Corporation have specific powers to trade in the manner that they are doing. Hire-purchase seems to be another line that Electricity Departments are now pursuing as an accompaniment to reductions; and Dublin has set out, as we have shown, on a course of their own for encouraging new consumers with a six months' dosing of half-price electricity. One benefit from our point of view will be that it will, if allowed to continue, encourage extravagance, and then—well, the Gas Company will benefit.

Electricity generating-stations have many times been accused of not being very delectable neighbours. The Astronomer Royal (Sir W. H. M. Christie) is disturbed by the schemes for the supply of electrical power to London and the surrounding districts, on the ground that the proposed planting of generating stations in the immediate neighbourhood seriously threatens the continued efficiency of the Royal Observatory. He reported this to the Board of Visitors and other men of science who were at the Observatory last week. The excessively tall chimneys will, unless their height be materially reduced, interfere with the observations of the stars near the north horizon, and will, through the effect of heated air, render the results untrustworthy. Secondly, there is grave risk that vibrations from the extremely powerful engines which are being installed at the Greenwich generating station will seriously affect the value of observations by reflection from a mercury horizon which are essential for the fundamental work of the Observatory. Even with the small portion of plant now available for work, serious tremors are produced; and though it is hoped that these may be reduced by the improved working of the engines, the alternative of providing a remedy for interference in this way with Greenwich meridian work may have to be faced. What with the Commissioners of Works complaining about the effect on plant and tree life of the emanations of generating station chimneys, and now the Astronomer Royal having a shot, the London County Council must begin to wonder where their mischievous electricity stations would be welcomed.

There is a little explanation to be made in connection with the comments last week on the Hastings Corporation electricity accounts. In connection with the arc lamps, the lamp charge, it appears, has to be added to the charge for current, as it is nothing more nor less than a current charge; and in this way, as a kind of Wright's system, the current is charged at a low rate per unit—viz., 1½d. in this case—in addition to a standing charge per annum on the maximum load required. If the figures are worked out, it is seen that, taking current and lamp charge together, as should be the case, the average cost per unit is 2·76d. It is remembered that years ago the Gas Company offered to supply current at 2½d. per unit. The arc lamps appear to be estimated as taking over 800 watts. As the maximum demand at £15 per kilowatt (or unit) per annum amounts to £12 10s., that is five-sixths of one unit.

PERSONAL.

Among the new appointments to the Borough Bench at Salford made last week, we are pleased to notice the name of Mr. ROBERT DEMPSTER, of Messrs. R. & J. Dempster, Limited, of Manchester. We congratulate him heartily on his selection for this important position, to the discharge of the duties of which we are sure he will bring impartiality and clear-sighted judgment.

Mr. JOHN KEILLOR, the Manager of the Peterhead Gas-Works, having been appointed Manager of the Hamilton Gas Lighting Company, of Ontario, the Town Council of Peterhead met last Wednesday to consider the filling up of the vacancy caused by his resignation. After a discussion, it was agreed that Mr. RITCHIE, who has been in the works for eleven years, and has served under three different Managers, should be appointed *ad interim*.

On April 23 a complimentary smoking concert was organized by the staff of the Australian Gaslight Company, at Sydney, for the purpose of bidding "Good-bye" to Mr. R. J. LUKEY, the Secretary, who was then on the eve of his departure for Europe on a holiday trip. During the proceedings, the Chairman (Mr. F. E. Williams, Accountant), on behalf of the staff, presented Mr. Lukey with a pair of "Zeiss" binoculars, and expressed the hope that he would enjoy his trip, and be much benefited in health by the change. An excellent musical programme was gone through.

Alderman W. HORNBROOK, the Chairman of the Gas Committee of the Devonport Corporation, was last Thursday week presented with some gifts, including a purse of gold, subscribed for by his colleagues in the Town Council. Mr. F. Paul, who presided, referred to Mr. Hornbrook's services to the town. Alluding to the "trouble, strife, and bitterness" passed through some twelve months ago, he said that on that occasion Alderman Hornbrook fought a battle, not in the interests of himself, but of the community; but he had to pay. The community would, however, eventually reap the benefit. They had now met to show their sympathy and appreciation, and to offer thanks for the work he had accomplished.

The Chairman of the Streets Committee of the Corporation of London (Mr. J. W. Domoney) entertained the members and a number of gentlemen at dinner at the New Gaiety Restaurant on Monday last week. Among those present was Mr. ALPHÆUS C. MORTON, M.P., the late Chairman of the Committee, whose name came prominently before our readers a short time ago in connection with the adoption of incandescent gas lighting in the City. In the course of the after-dinner proceedings, the Chairman proposed Mr. Morton's health, and remarked that he had been re-elected for three years in succession as Chairman of the Committee. This was an honour unique in the Corporation. The Streets Committee, under the guidance of Mr. Morton, had gone in for incandescent gas lighting in the streets; and he had succeeded in carrying out a scheme for the disposal of the refuse of the City of London. In conclusion, he presented Mr. Morton with a framed illuminated address, voted by the Committee, and articles of jewellery for each of his five daughters. The toast was very cordially received. Mr. Morton, in responding, said that he had always felt he had the sympathy and support of the Committee in all that he tried to do. The Committee had lighted the City better than any other city in the world, and during the last three years had gained in reputation so that no Committee was held in higher esteem. During the last three years they had changed the lights of the side streets at very little cost above the old flat-flame burners.

LABOUR CO-PARTNERSHIP.

THE proceedings at the recent half-yearly gathering of the Labour Co-Partnership Association, which was held at Batley, were of an unusually interesting character—including, as they did, an address by Mr. T. C. Taylor, M.P., on "Profit-Sharing," a paper by Mr. J. D. Stuart Sim (the Chief Registrar of Friendly Societies) on "Ownership of Capital by the Working Classes," and some remarks by Mr. Henry Vivian, M.P., on "Labour Co-Partnership in Practice." It is impossible for us to give even an outline of the whole ground covered by these three contributions, and by the discussions which took place; but there are one or two points which may be briefly touched upon, as the general subject is one in which the "JOURNAL" and many of its readers are keenly interested.

The conference was held under the presidency of Mr. Taylor, who, in his address to the members, remarked that all who studied the present relations of employers and employed knew that there was a too prevalent attitude of mutual suspicion. This meant not only a diminishing rate at which the material wealth of the country was produced, but it constituted a menace to the very fabric of society as now organized. The object of the Association was the unifying of the interests of capital and labour by securing the granting to employees of a share in the undertaking. In giving particulars of the profit-sharing scheme in operation in connection with his own business, he said he believed he had not lost money by it; while in the matter of comfort and happiness he had immensely gained. His own scheme was originated in 1892, when there were some 600 employees. It began with the managers, and was then extended to the foremen. Now every man, woman, and child who has been in the employ of the firm for a full year has a share of the profits; the business having been turned into a limited liability company solely for this purpose. After 4½ per cent. interest has been paid each year on all the capital (as it stands in the books—nothing being reckoned for goodwill), all further dividend is shared between capital and labour at the same rate per cent. The profit is paid in shares, which so far have no voting power. Mr. Taylor is, however, hopeful that the time is coming when voting power may be conferred on those most fitted to exercise it. Any shareholder leaving the Company's employ must, within six months, sell his shares; and these shares must be purchased only by someone who is in the employ of the Company. In 1905, a bonus of 10 per cent. was paid on the wages, and in addition a special bonus of 5 per cent. was given to celebrate the sixtieth anniversary of the founding of the firm. When he was asked the result of profit-sharing upon the character of the employees, said Mr. Taylor, he divided them into three classes. There was the class who would under any condition do their best; the class that were so unappreciative that kind treatment was quite thrown away upon them; and, lastly, the class (which formed the vast bulk) who, like the employers, were neither very good nor very bad, but who were wonderfully amenable to influence. He was glad to say that, slowly but surely, the latter were learning the lessons that profit-sharing taught. It was not a cure for all evils. It would not make bad people good, or a bad business a good one; but it would make decent folk better, and a good business a better one. There were signs that the time was soon coming when civilized nations would not murder each other; but was not industrial warfare nearly as bad? The profit-sharing spirit was the best way to improve the relations of capital and labour; and he believed that if the two parties were working heartily together, the hours of labour could be reduced and wages advanced, without the least injury to the capitalist.

At the outset of his paper, Mr. Stuart Sim gave particulars of the large sums owned by the various friendly and other societies; and he then referred to certified schemes under the Workmen's Compensation Act. While admitting that he was treading on delicate ground, he unhesitatingly gave it as his opinion that the "contracting-out" clause of the Act was one of the greatest boons conferred by the Legislature on the working man. What, he asked, was the security a certified scheme gave to a member who belonged to it? In the first place, the Registrar had to be satisfied of the following matters before he granted a certificate: (1) That the employer would not have to pay less under the scheme than he would have to pay under the Act; and (2) that the workmen and their dependents would under the scheme derive, on the whole, not less benefit than they would derive under the Act. In other words, he had to be satisfied that the scheme was actuarially solvent and financially sound; and he had also to be satisfied that the employer paid not less than he was liable to pay under the Act. It was true the working man had to contribute; but his contributions went to extra benefits which he could not get under the Act. He concluded by saying he only wished he could convince Trade Unionists and those interested in the working man, what a splendid opportunity was afforded by this section for regulating, in the words of the Trade Union Acts "the relations between workmen and masters in a thoroughly satisfactory manner, and on a sound financial basis." Such a pronouncement from one occupying the position that Mr. Sim does, is certainly interesting. Several of the members disagreed with his remarks as to the contracting-out clause; but, in reply, he said the schemes were appreciated by the members, and if the clause was abolished they would continue. Of the total number of workmen employed by firms having such schemes in operation, no less than 84 per cent. belonged to the schemes. He added that if the time at which compensation was payable after an accident were reduced to one week, instead of remaining at a fortnight, as at present, the increase in cost to the employer would be about 25 per cent., for the great proportion of injuries by accidents were cured within a fortnight.

Mr. Vivian, in the course of his paper, gave particulars of a number of schemes—among them that of the South Metropolitan Gas Company, which he pointed out was the largest co-partnership development through an ordinary company. In the course of the discussion that ensued, the unemployed question was introduced—one member giving it as his opinion that the improvements in machinery were responsible for throwing large numbers of men out of work. Another, however, said he would like to know how many of the millions in this country would have been unemployed had there been no labour-saving machinery invented for the last hundred years. Mr. Vivian remarked that if it were really true that improvements led to their being unemployed, they would all, considering the improvements in all kinds of industries in recent years, be now out of work. To reduce it to an absurdity, if improvements were the cause of lack of employment, they ought to go back to the time when they would be digging with their finger-nails. The assumption underlying the question was wrong. If England had invented nothing for the past fifty years, it would certainly have been very serious for those who lived to-day.

THE PATENT OFFICE IN 1905.

THE profitable nature of the business transacted by the Patent Office is once more made manifest in the twenty-third report of Mr. C. N. Dalton, the Comptroller of Patents, Designs, and Trade Marks, though the number of applications last year (27,478) was 2224, or 7·4 per cent., less than in the preceding twelve months. This falling off is ascribed to the fact that inventors, at the end of 1904, were probably anxious to lodge their applications before the Act of 1902 came into force (the date of which was, it may be pointed out, Jan. 2, 1905), and thus avoid not only the official search for novelty prescribed by the Act, but also the payment of a sealing-fee before a patent could be granted. Additional interest attaches to the report on the present occasion, seeing that it embraces a complete twelve months' working of the new Act; and naturally a considerable portion of it is devoted to this particular aspect of the patent question.

With such a radical alteration in the method of procedure as Section I. of the Act brought into existence, there were, of course, serious difficulties to be overcome at first; but in most respects this has now been successfully accomplished. The section—which it is hardly necessary to remind "JOURNAL" readers requires an official investigation to be made for the purpose of ascertaining whether inventions sought to be patented have been entirely or partially claimed or described in specifications of prior date—is on the whole working very smoothly and satisfactorily; patent agents and their clients, it is remarked, appearing to realize that it is to the interest of inventors that they should be informed of anticipating specifications. Generally they have readily embraced the opportunity of amending their specifications, so as to distinguish clearly their inventions from those to which attention has been directed as the result of the official investigation. Consequently it is possible to state that the work under the new Act has been carried out with less difference of opinion between the parties than might have been expected, in view of the great changes which have been introduced. In a large number of cases no reference to the Comptroller was found necessary; the requisite amendments having been made before the reaching of this stage.

Some idea of the work that is entailed on the Patent Office by the new system will be gathered when it is mentioned that during the year the Examiners made investigations in 10,379 cases; while it must have given considerable shock to the large number of inventors thus represented to learn that in over 60 per cent. of these cases the proposals had been wholly or in part anticipated. Of 1335 hearings before the Comptroller fixed for the purpose of determining whether any reference to a prior specification ought to be made in the specification in question, by way of notice to the public, 532 were rendered unnecessary (by abandonment or amendment before the date of the hearing); while out of the 803 decided cases, in only 154 was such a reference ultimately inserted. That the decisions have been regarded as generally sound, seems evident from the fact that only one appeal from them has been entered; and this has not yet been decided. Another reform has been brought about by Rule 4 of the Patents Rules, 1905, which has for the first time rendered it necessary that the statement of the invention claimed with which a complete specification must end should be "clear and concise, as well as separate and distinct from the body of the specification." This, it is remarked, has had considerable effect in checking undue multiplication and repetition of claims. Here, again, in only one instance was an appeal entered against a decision of the Comptroller; and in this case, also, it is satisfactory to note, his finding was upheld.

Turning to the financial side, we find that the receipts last year for patent fees amounted to £238,047, which was a very substantial increase over the £222,971 of 1904. The receipts from designs fees showed a small increase of £317; while trade mark fees were £2730 less. Sales of publications realized £9676, which was an increase of £660. Altogether the receipts amounted to £265,740, as compared with £252,417 in the previous year, or an increase of £13,323. The sum received for renewal fees was £142,411, as against £138,684; while the new sealing fees brought in £4277. There was a very large decrease in the expenditure on behalf of the office; the figures being £159,296 in 1905, compared with £213,842 in 1904, or £54,546 less. Practically the whole of this saving was represented by the smaller sum expended on the Patent Office extension. Owing no doubt to the extra staff necessitated to carry out the provisions of the new Act, payments for salaries were nearly £10,000 more; but, on the other hand, the greater part of this sum was saved in the item of stationery and books.

The falling off in the number of applications last year applies to both British and foreign inventors; those from the United Kingdom exhibiting a decrease of 4·8 per cent., and those from Foreign States of 14·5 per cent. The applications from British Colonies and Possessions, on the other hand, rose from 714 to 755—an increase of 5·7 per cent. Of the Foreign States, the largest decreases are shown by the United States, Germany, and Belgium; while Japan, as is to be expected of so progressive a country, exhibits an increase, though even now the total is only trifling—a state of affairs which will, it may safely be predicted, be altered in time to come. Of the total number of 14,786 inventors to whom patents were granted in 1905, 2505 were resident in the United States, 1956 in Germany, 806 in France, 216 in Austria-Hungary, 178 in Switzerland, 146 in Belgium, 113 in Canada, and 105 in Sweden. During the past five years, the proportion of patents granted to foreigners has shown a tendency to diminish; the figures being 50·3, 47·3, 47·4, 46·5, and (1905) 42·3. As to the number of patents sealed, 16,040, or 54 per cent., of the applications made in 1904 reached this stage; while only 530, or 4·5 per cent., of the patents sealed upon applications made in the year 1892 were maintained for the full period that is allowed—fourteen years.

The progress of invention in different directions is shown by the setting out of the 146 classes into which the subjects are divided. The most striking advance is, the report points out, shown in all types of prime movers, but particularly in electric motors, rotary engines and turbines, and air and gas engines, which have since 1901 increased to the extent of 87, 85, and 66 per cent. respectively. Taking the years 1904 and 1903, the numbers of accepted complete specifications dealing with the principal matters in which "JOURNAL" readers are interested were as follows, the figures for 1903 being placed in parentheses: Air and gas engines, 515 (437); cooking, &c., 216 (172); gas distribution, 62 (56); gas manufacture, 180 (144); heating, 321 (245); and lamps, &c., 478 (400). Invention, like other things, is subject to "crazes;" and referring to the trend of ideas in 1905, the Comptroller says that while proposals with regard to motor cars and other forms of locomotion showed a falling off, there was a striking increase (to the extent of 81 per cent.) in the number of inventions relating to railway signalling, largely due to the unfortunate occurrence of several "tunnel mysteries" during the year. Much attention was directed to turbines, as in the previous year; and there was a growth of 24 per cent. in the number of inventions for pumps. A striking development in both gas and oil lamps was due mainly to improvements in the construction and application of incandescent mantles. The number of applications relating to arc and incandescent electric lamps decreased considerably, though the number of mercury vapour lamps continued to increase.

The death took place at Droitwich a few days ago of Mr. Charles Henry Crane. Deceased, who was in his 77th year, was at one time Chairman of the Wolverhampton Gas Company. He was also a member of the Tettenhall Urban District Council.

The members of the Isle of Wight Gas Association had their usual conference on Wednesday last in the Board-room of the Shanklin Gas Company—Mr. Frank C. Taylor, the Engineer, Manager, and Secretary of the Company, presiding. There was a good attendance of members, and a well-sustained discussion took place on the progress of the gas industry and the general business of the Association. Subsequently the Directors and officials of the Company had a social gathering, the chief toast of which was "Health and Prosperity to the Shanklin Gas Company," proposed by Alderman Groves, and responded to by Messrs. Cooper and Young.

Two reports have lately been issued by the British Fire Prevention Committee, containing particulars of experimental tests of the fire resistance of concrete floors. The two floors were practically identical in design, and were subjected to the same conditions. The results of the tests were, however, very different, according to the concrete used. The one having Thames ballast concrete for the protection of its steelwork failed; while the other, with clinker concrete and coke breeze protection to the girders, remained intact. No independent fire tests on such a scale with floor areas measuring 15 ft. by 22 ft. had previously been carried out.

PROGRESS IN GAS MANUFACTURE IN ENGLAND AND AMERICA.

LAST week we noticed (pp. 569-70) the earlier portions of the "Progress Department" report of the Ohio Gaslight Association—under the editorship of Mr. Alfred E. Forstall, of New York. To-day we give some particulars as to the contents of the later sections of this interesting compilation.

DISTRIBUTION.

Governors.—No improvements in street-main governors have been noticed since the first report in 1903, nor have any been reported during the past year in service or house governors.

Consumers' Meters.—During the period since 1903, various points in the construction of dry meters as ordinarily made have been the subject of much criticism on the part of gas engineers; and as a result of this criticism meters known as the "A" type have been made and are being tested under actual working conditions. Two sizes of these meters have been actually made—the 5 "A," with the same outside dimensions as the ordinary 5-light meter, and the 10 "A," with the same outside dimensions as the ordinary 10-light meter, and meters of the 30 "A" size will be ready in a few months. As was noted in last year's report, meters of this type have larger valves and channels, and therefore are able to pass more gas with the same differential pressure than ordinary meters of the same dimensions. They are also equipped with diaphragms which do not touch the meter case in any part. Some of the 5 "A" meters have been in use for nearly a year; and at the last meeting of the American Gaslight Association, there were given the results of tests made upon those which at that time had had the longest service, in order to determine how they had stood up to the rapid movement of the diaphragm and valves. These results were of a conflicting character, and longer experience is necessary before a final decision can be passed upon the value of meters of this type. During the past year, it has become possible to buy consumers' meters equipped with straight reading dials only. The Company manufacturing the rotary meters of the station meter and consumers' meter sizes, which have been referred to in previous reports, have organized an American Company which it is stated will soon be doing business; so there will be an opportunity to determine how much progress these meters represent. One test recently made of a small meter in America was not very favourable.

In prepayment meters no particular improvements have been noted since 1903. One manufacturer reports the adoption of a concealed lock on the cash-box, making it more difficult to break into it, as well as attracting less attention. The contrast between the rapidity with which the use of prepayment meters has increased in England and the comparative slowness of their adoption in America, which has been referred to in previous reports, may possibly be explained by the fact that in England the gas undertakings, are permitted to, and do, charge more for gas supplied through these meters than for that supplied through those of the ordinary kind. Part of this extra charge, which averages about 20 c. per 1000 cubic feet, is to cover the interest on gas piping and fixtures supplied free; but part of it is intended to cover interest on the additional cost of the meter itself and the extra expense of handling the account. If it were possible to make such a charge in America, the spread of the prepayment meter might be as rapid as it has been in England. One of the London Companies reports having in use 190,000 such meters; this being considerably more than half the total set.

High-Pressure Gas Distribution.—During the period since 1903, the advantages and disadvantages of high-pressure distribution for gas have been quite frequently discussed. Progress has been made towards determining how far it is economical to carry high-pressure distribution by obtaining more correct ideas as to the cost of compressing gas and forcing it through pipes at a high pressure. When the plan was first brought forward, no information was available—at least, none was given—as to the exact cost of compression, which, of course, is an offset against the interest and depreciation on the larger pipes and services required when distribution is carried on at low pressure. In a discussion on a paper on this subject read towards the close of last year, a gas manager who has had as much experience as anyone in connection with plants using high-pressure distribution, stated that the cost per 1000 cubic feet for compressing could be taken as 1·75 c., without including the cost of the gas oil required to offset the loss in illuminating value of 0·9 candle which experience had shown was caused by compression. He spoke of one case in which the compression cost 5 c. per 1000 cubic feet. Another speaker in the same discussion presented calculations showing that, at a cost for compression (including interest, depreciation, maintenance of compressors, and gas oil required to offset the reduction in illuminating value) of 2·5 c. per 1000 cubic feet, high-pressure distribution was more economical for districts where the quantity of gas sold per mile of main was less than 2 million cubic feet per annum, but was greater for all districts where the sales of gas were over this quantity.* As none of the figures given by this speaker were disputed, his conclusion may be assumed to be practically correct; and there is thus given a good indication of the field

* See "JOURNAL," Vol. XCII., p. 679; Vol. XCIII., p. 107.

which high-pressure distribution will be found to fill. By "high-pressure distribution" is meant the carrying of high-pressure right up to the inlet of the consumer's meter. The use, either for the supply of a distant district or for the equalization of pressures over the different districts of a city, of feed-lines operated under medium or high pressures, has a field which is not covered by the preceding calculation.

Low-Pressure Distribution.—In low-pressure distribution systems, the problem of securing the delivery of gas with a given drop in pressure and the lowest outlay in pipe, has received much more attention than was formerly given to it. Before such a system can be laid out with a definite assurance that it has been properly planned, it is necessary to have more accurate knowledge than is now available as to the average maximum rate at which gas is used by the consumers in any one block. In the absence of definite data as to this, the best that can be done is to take the average maximum consumption per consumer over the whole district. But it is probable that this general average does not apply to the case of (say) 15 or 20 consumers living along from 500 to 1000 feet of main, since the habits of these consumers are apt to be somewhat the same, and they are much more likely to all want their maximum supply at the same time than is the case with all the consumers over a large district. It was the intention of one gas company to try to obtain some data on this point during the past winter, by the use of a number of glass complaint meters, installed in place of the regular meters of consumers living in adjoining houses. The records made by these meters would show just what the maximum demand of the whole number of consumers supplied with these meters was, and from this could be determined the average demand per customer for that particular section. Either such information as this, or the information obtained by taking pressures after the system is installed, is necessary before it can be told whether the system made up of large feeders and 2-inch distributing mains, described in the 1903 report,* constituted progress in economy of distribution. In the laying of cast-iron mains for either low pressure or medium pressure, the tendency has been to use cement joints instead of lead. Several of the large gas companies have experimented very carefully with cement joints, and have arrived at the conclusion that, when properly made, these joints are much more reliable than lead joints, even on large-sized mains; one of the companies having used cement joints on quite a long length of 30-inch main with very satisfactory results.†

Prevention of Electrolysis.—The opening sentence of the paragraph which dealt with this subject in the report for 1903 was: "Unfortunately, but little progress has been made in the prevention of electrolytic destruction of gas-pipes by the return current of electric street railways operating in their vicinity." To a large extent, this still remains true. As long as direct current is used by electric street railways, and this current is allowed to return, even if only for a short distance towards the power house, through rails which are not insulated from the earth, there will be leakage of electricity into the ground, and electrolysis of pipes will take place when the conditions in other respects are favourable. Only by the adoption of a completely insulated return path for the current can it be entirely prevented as long as direct current is used. The use of alternating current would do away with the necessity for an insulated return; and some progress is being made in the direction of equipping street railway systems so that they may use alternating current. Direct current will, however, continue to be used in most places for a number of years; and it is therefore still necessary to attempt to solve the problem of what is the best way of reducing to the smallest amount the damage that must necessarily be suffered as long as electric railway companies cannot be compelled to use a completely insulated return.

Judging from a discussion on the subject, at the meeting of the American Gaslight Association last October, opinion is still divided as to whether it is better to attempt to make a line of pipe as good a conductor as possible, and then bond it to the rails at the proper point for the current to leave the pipe, or to make the pipe as poor a conductor as possible, and prohibit any bonding to the rails. There is no doubt that, no matter how poor a conductor the pipe is made by the use of insulating joints or other means, it will still carry some current; and therefore there will be a slight amount of electrolysis. It is, however, also certain that no gas-pipe can be made a perfect conductor, and that, no matter how carefully the work is done, there will always be places at which current will leave the pipe to return to it at points farther along; and since a pipe that is made as good a conductor as possible, and bonded to the rails, will carry a large current, much damage will be done at the points where the current leaves. On the other hand, a pipe the conductivity of which is destroyed as much as possible at short intervals, will carry only a very small amount of current; and although this will leave at many points, the total amount of damage done should be very much less than with a large current leaving at a few points. The best means of preventing electrolysis would therefore seem to be to destroy the conductivity of gas-pipes as far as possible, to the extent, if necessary, of making every joint an insulating one. For this purpose, cement joints are better than lead joints.

* See "JOURNAL," Vol. LXXXVI., p. 307.
† *Ibid.*, Vol. XCI., pp. 178, 243.

As for the legal aspect of electrolysis, the Dayton (Ohio) case mentioned in last year's report* has been carried one step farther; a decision having been rendered in it by the Circuit Court upon an appeal from the judgment of the Common Pleas Court. The Circuit Court sustains the Lower Court and fixes the liability for damage upon the electric railway, which is enjoined from operating its road negligently. But the judgment states that the case presented did not authorize the Court to require the railway to change from the single-trolley system to one that would do less damage.

LAMPS, BURNERS, &c.

Incandescent Gas-Burners.—Incandescent burners do not show any progress in the burner proper; the changes which have been made concerning the manner in, and the points at, which the secondary air supply is admitted, and the appearance of the burner and the glassware as a whole. More pains have been taken to make burners of what might be called standard dimensions, in order that the same glassware can be adapted to different burners, instead of it being necessary to buy glassware suited to each kind of burner. The popularity of air-hole glassware noted in the report for last year, still continues. Judging from observation, many of the special forms then mentioned have not shown sufficient superiority over the older forms to bring themselves into general use. The mantles that were employed in 1903 still hold the field; the newer types mentioned in subsequent reports having so far failed to obtain much of a foothold if they have been placed on the market. Unless there is discovered some now unknown element, or combination of elements, of higher light-giving powers than the mixture of thorium and cerium used in the Welsbach mantle, or some new material which can serve as the base of the mantle, there is little prospect of any improvement in them.

High-Power Lamps.—In high-power lamps, which, as noted in the previous reports, have been developed and used quite largely in Europe, but which have not been employed to any great extent in the United States, the principal changes made have been, not in the lamp itself, but in the appliances for compressing the gas supplied to it. The general tendency seems to be towards the use of water-motors for this purpose; it being always easy to secure a supply of water wherever gas can be obtained.

Inverted Incandescent Burners.—Inverted burners are not mentioned in the report for 1903, as they had not at that time been introduced commercially into America. The principal improvements effected in them since their introduction have been those required to make the burners suitable for the different kinds of illuminating gas used in the United States. A reversible burner that can be used on either an ordinary or an inverted gas-fitting without any adapter, and also a multiple-light outdoor lamp and an automatic lighter, have been brought out. On account of the absence of any parts that throw shadows downwards, inverted burners would seem to constitute progress in the field of lighting spaces situated below the source of light, as must be done in the case of rooms lighted from a central chandelier. It was noted in the report for last year that burners of this type were being used in Europe for lighting railroad cars in connection with the Pintsch gas system. This use of inverted burners has been extended to the United States; there being a considerable number of cars now lighted by this means.

Street Lighting by Gas.—Though all the flat-flame street-lamps in the borough of Manhattan, New York City, have been replaced by incandescent gas-lamps, no such increase has been made in America as has been made in Europe in the amount of street lighting done by gas. In London, the lighting of two new streets that were opened during the past year had been given to gas, after having been thrown open to competition; high-pressure lamps being used for the purpose. A number of streets in the City of London have also been turned over to ordinary incandescent gas-lamps, after having been lighted for a number of years by electricity. Even in Europe there does not seem to have been a very great increase in the number of lamps automatically lighted or extinguished from a distance, although several new systems of this kind were patented during the past year. No such system is in use in the United States.

Self-Lighters.—The situation as to chemical self-lighters remains as stated in the report for 1903. New forms are being brought out from time to time; but in America, where most of the illuminating gas distributed contains less hydrogen than the coal gas ordinarily found in Europe, these lighters are not commercially successful. A pneumatic lighting and extinguishing device (consisting of a push-button air-pump connected by tubing of small diameter to one or more piston valves, each of which controls the supply of gas to a burner), by means of which one or several lights can be lighted or extinguished by pushing or pulling a button fastened on the wall at a convenient point, is being experimented with by one of the large gas companies, and seems to promise favourably.

APPLIANCES.

Gas-Engines.—The chief progress made of late years in the knowledge of the underlying principles affecting the economical operation of gas-engines has been in the clearer perception of the benefits derived from compression of the charge before explosion, of the reason why compression is beneficial, and the steps that are necessary to take to be able to use high compression without

* See "JOURNAL," Vol. XC., p. 365.

premature ignition through the heat developed by compression. It was this increased knowledge that led to the successful use of "poor" gas, or gas of low heating power, by which was brought about the construction of large engines of 1600-horse power and upwards. It has also been realized that for many purposes greater all-round commercial efficiency could be secured by sacrificing either thermal or mechanical efficiency to a slight extent for the purpose of securing better speed regulation or more economical construction. Thus one type of engine relinquishes the benefits of uniform compression for the sake of obtaining close speed regulation by variations in the free volume of the charge instead of missing explosions; while two other types, built in large sizes, have, by the addition of auxiliary gas and air pumps, reduced the mechanical efficiency for the sake of obtaining an explosion for each stroke.

Improvements in the details of design have been chiefly devoted to strengthening parts that experience has shown to be structurally weak, to arranging water-jackets so as to avoid breakages due to unequal expansion and contraction, and to simplifying the valves and making them more accessible. Some types of engines do away entirely with the exhaust-valves; the exhaust-ports being opened and closed by the piston itself. In one form of engine recently designed, an attempt is made to avoid the difficulties arising from the friction between the piston and the cylinder at the high temperatures produced by the explosion of the charge, by having the portion of the cylinder through which the piston travels filled with a liquid, and thus protected from the heat of the explosions which take place alternately in vertical extensions of the cylinder, and push the liquid (and with it the piston) backwards and forwards. This form of engine has not been tested sufficiently to tell whether or not it constitutes progress.

There has been practically no increase in thermal efficiency secured since the report in 1903. In fact, this report states that "as high as 34 per cent. of the theoretical heat value of the fuel can be transmitted as power to the engine-shaft;" while in 1905, Mr. Dugald Clerk—a high authority on the subject of gas-engines—stated that in the cylinder a thermal efficiency of 35 per cent. could be obtained with engines of 50-horse power or upwards, with a mechanical efficiency of 86 per cent., which gives only 30·1 per cent. of the theoretical heat value of the fuel at the shaft. These efficiencies are not obtained under ordinary working conditions. It is considered that an expenditure of 12,000 B.T.U. per horse-power-hour is an average result; and this corresponds to a final efficiency of about 21 per cent.

Gas-Ranges.—There have been no great improvements made in the construction of gas-ranges, although slight changes have been made from time to time leading to a better supply of air to all the jets of each of the burners, and thus to more perfect combustion, and making it possible to remove and replace burners and linings, and to clean the non-removable portions with greater ease.

Gas-Heaters.—As far as the Editor has been able to learn, there have been made no changes in the principle upon which the ordinary types of gas-heaters operate, and only slight changes in their design. The condensing stoves mentioned in the last report, and very extensively advertised in England, in which, it is claimed, practically all the water formed by the combustion of the gas is condensed, do not seem to have been put on the market in America. No progress has been made in gas-heated hot-air or hot-water furnaces. This will be readily understood when the comparative costs of illuminating gas and coal as fuel for such heating are considered.

Water-Heaters.—The only changes that have been made in circulating water-heaters are in the design; and their object has been to make both the interior and the exterior of the water sections more easily accessible for cleaning. The Editor would suggest that progress in heaters of this kind could be made by the designing of one in which the water and the hot products of combustion would travel in opposite directions, so that the products could impart all their heat to the water, and the efficiency be greatly increased. Another point to which enough attention is not always paid, is that of keeping the burner at a sufficient distance from the nearest surface of the water sections to prevent the flame from striking this surface. In many heaters, the flame reaches the surface, and the result is imperfect combustion and a consequent loss of efficiency. Instantaneous water-heaters also present only minor improvements in design.

Miscellaneous.

Gas-Producers.—The attention paid to gas-producer plants for use with gas-engines seems to increase; several firms in the United States being ready to contract for complete installations for producers and gas-engines, and to build producers in any one of a number of styles, from the simple and small suction producers up to the large ones of the Mond type with recovery of bye-products. One firm is prepared to add to the producer and gas-engine installation centrifugal pumps for water service, with an especial view to high-pressure service for fires. Though this subject of gas-producers is not of interest to the central station gas manager from the manufacturing point of view, its does interest him greatly from the sales standpoint, as there is no question that the extension of their use will have a tendency to interfere with the sales of illuminating gas for engine purposes. It is therefore important that gas men should keep posted as to what is being done in this line, in order to be in a position to meet the competition as far as possible.

Municipal Ownership of Gas-Works.—Although there have been in the United States no transfers of gas properties to municipalities during the past two years, there is nevertheless a well-developed movement on foot to push municipal ownership of gas properties; and a great deal is being written on the subject in various newspapers and magazines. The National Civic Federation has appointed a Commission to investigate the subject of municipal ownership, not only of gas properties but also of electric light plants and water-works.* The Commission have experts now at work; the idea being to examine specimen plants, both municipally and privately owned, using the same method in both cases, and to determine from these examinations which kind of ownership is giving the best results to the communities served. This examination has been planned upon a basis which will make it exhaustive and impartial; and the report of the Commission should go far to settle the question of the value of municipal ownership under present conditions.

There will no doubt be noticed many omissions in the above report; but the Editor has thought it better to treat quite fully the branches in which change seemed most evident, even though this rendered it necessary to entirely omit any reference to other branches in which there had been little or no change.

HIGH-PRESSURE GAS DISTRIBUTION.

The subject of the distribution of gas at high pressure has been under the consideration of a Committee of the Ohio Gaslight Association; and at the recent meeting of the Association, the Chairman of the Committee (Mr. J. D. Shattuck) presented their report. In the course of it, the Committee made the following remarks.

The three most important problems in high-pressure distribution not as yet satisfactorily solved are: First, the best high-pressure formula, proved by a sufficient number of tests; second, to eliminate electrolysis, which is the most serious problem we are now confronting, and the one that seems to be the farthest from solution; and, third, the satisfactory removal of condensation due to compression. The Committee believe that the removal of moisture depends upon the reduction in the speed of gas after leaving the compressor and frictional contact with finely-divided plates. The present appliances for removing moisture have been limited to expansion tanks containing diaphragms; but these have been inserted without reference to the velocity at which the gas is travelling. We believe that the tanks should be large enough in diameter to reduce the flow of gas to a low speed, and should contain frictional plates, like a tar-extractor, of sufficient number to break the gas up into a good many fine streams. The loss of illuminating power under some conditions has been found very great; in one instance, a loss of seven candles in nine miles. This loss was due, however, to the introduction of a new oil, which required considerable experience in the handling, before this trouble was partly eliminated.

We wish to call attention to two features of high-pressure distribution that demand strengthening. While U seals have been considered satisfactory in the past, and are a very cheap form of seal, there is danger that they are filled with water or a poor quality of oil that will freeze—such instances having been discovered in spite of the most careful inspection; and it is recommended that some form of mercury seal be adopted, especially as new seals have been brought out which require little mercury to work them. Another point is the fittings used between the service and the governor. These should be much stronger and heavier than the usual stock fittings, and the pipe and nipples should be all very heavy pipe to give the necessary thickness of metal at the threads. This extra precaution would add little to the cost of the installation; but it will be a safeguard well worth the expenditure. It has been found on several trials that very little strength is required to snap some of the threads about a high-pressure installation.

Uniformity of Gas-Meters in America.—A Committee of the Ohio Gaslight Association have recommended the Association to adopt, as a standard differential pressure at which to measure the capacity of meters, 3-10ths of an inch of water; the manufacturer to arrange to supply the gas company with five standard size meters, which would have a capacity, at the previously mentioned pressure, of 100, 150, 300, 500, and 750 cubic feet respectively. They also recommend that meters should be designated by their cubic-feet capacity at the standard pressure named, and should be plainly marked to show the quantity of gas they will pass. They likewise recommend that no larger sizes should be specified until further data are available in regard to the attempt to manufacture meters which are rational in dimensions in all their parts. The report came before the members at their annual meeting, and was adopted with an amendment to the effect that the medium to be used for testing meters should be air.

* See *ante*, p. 18.

COMETS IN THE GAS INDUSTRY.

By An Observer.

Introduction.

Comets are mysterious bodies that turn up at irregular intervals, create a great sensation for a time, and then disappear, so far as our universe is concerned. Some of us are old enough to remember the popular excitement with respect to a comet that was expected to approach near enough to cause serious inconvenience by attracting the earth away from its proper orbit, with unfortunate effects as regards climate and other conditions; and the suggestion was made that it might cannon into our respectable planet broadside on, to the general disorganization of all things temporal. There are certain topics that in these respects occupy the position of comets in relation to technical literature and discussions. Some of them appear to possess sufficient importance, for a time, to threaten that the usual procedure will be knocked entirely out of the accustomed track; but after a brief, though brilliant, scintillation, they have suddenly collapsed, and nothing more is heard of them. There is usually a family likeness in the first introduction, the progress, and the exit. The saying that "history repeats itself" may be partly due to the fact that there are certain questions—or should we say problems—that come up for a nine days' notice at irregular intervals, attract a great deal of attention, but finally go back into the obscurity from which they emerged, leaving things exactly as before.

The Position, Pay, and Prospects of the Gas Manager.

This is one of the topics that is energetically discussed from time to time, and that without the slightest visible effect on the actual position. Such points as whether he has made his situation or his situation has made him; if a highly-educated technically trained man is really required for the office, or if an intelligent stoker could fill it with as much acceptation; whether he is more inclined to the rest-and-be-thankful frame of mind than to be up and doing; whether he shuts himself up inside his own shell or keeps an energetic look-out as regards progress in other places; and why, in spite of increasing profits and multiplication of departments, the remuneration obtainable by a really skilled practitioner tends to become smaller by degrees and anything but beautifully less. These and many others are discussed with more or less ability and knowledge of actual facts. Some of those who attempt to enlighten the profession at large have no hesitation in rushing in where angels fear to tread; but we will not on this account go further in the direction of completing the well-known quotation. There is not very much point in wide generalisms, such, for example, as asserting that ability is not recognized on pay day, but that all are regarded as on one level, or that there is no ability to recognize, and that the industry has flourished in spite of those responsible for its well-being rather than as a consequence of their skill. A weak point in these discussions is that they are the result of individual feeling or experience rather than of a wide searching view of the whole subject taken from an independent position. A pronouncement claiming to be the voice of the people of England is really only the personal views of three tailors in Tooley Street; and it is cheerfully acknowledged that this applies as much to the present communication as to others. Those whose lines have fallen in pleasant places are naturally satisfied with the existing order of things, and do not seek a change. Others, who may be equally deserving but less fortunate, take the opposite view. The world is all right in the eyes of the prosperous man, but all wrong to the one that is out at elbows; and the discontented party usually talk the loudest and make the biggest splutter. They are able to agree together to the extent that something ought to be done; but directly an advance is made beyond this point, the history of Babel is completed. There is difference of opinion and confusion of ideas; and after a great deal of talk, the whole thing falls through. The position, pay, and prospects of the gas manager are decided by the personality of those more immediately concerned, or by the inexorable laws of supply and demand; and the Institution of Gas Engineers or other representative body can do no more to influence the question than a parliamentary faction can control the size of the poor man's loaf.

Whether the majority of those responsible for the sale of gas have moved with the times to the extent that they might or ought to have done, is to a large extent a matter for personal opinion; but I do not think that anyone who has worked in gas circles for 25 or 30 years will assert that there is not substantial advancement in the capabilities and in the work actually done by the present-day gas manager, compared with his predecessor of the seventies. If the development that has taken place during that period is to be credited to the assistance afforded by statutory protection, there is a more intimate connection between politics and supply and demand than is commonly supposed; and the public representatives at Westminster may properly direct their attention to languishing industries and unemployed artizans. If Acts of Parliament have doubled the sales of gas in twenty years, surely they can do something for other industries that are urgently in need of assistance to keep life in them at all; and we have a very powerful argument in favour of protection. But one would like to know in what way the Houses of Parliament have assisted the development of the generator furnace, retort-house machinery, the mechanical handling of solid materials, the Welsbach mantle, the automatic slot meter, numerous schemes for providing appliances free of first cost, maintenance systems, and many other factors that have bulked largely in the establishment of the present position. Parliamentary protection has certainly facilitated matters by enabling capital to be raised at low rates, thus directly benefiting the consumer by reducing the price at which gas can be sold, and at the same time indirectly giving the business a lift, because the lower the price the stronger will be the demand. But, even in these matters, statutory enactments are permissive rather than active. They facilitate the control of a certain position, but do not in any sense establish that position in the first place. That there is some advantage in the Special Act is always admitted; but the tendency—especially outside the profession—is to exaggerate the value.

There is an impression that the parliamentary enactment guarantees maximum dividends; whereas they have to be earned before they can be paid in any case. The demand and supply of gas is regulated by exactly the same conditions as those which govern the sale of any other commodity; and the incorporated concern is quite as dependent upon the goodwill of its customers as an individual unauthorized venture. Yet some appear to imagine that, given two concerns whose circumstances differ only by the fact that one possesses a Special Act of Parliament while the other does not, there is nothing at all for the management to do in the first place, and everything in the second. Or if the increase of 4 or 5 per cent. per annum in the sales (which is a very usual experience) is the result of spontaneous growth, vigorous enough to rise independent of and superior to the exigencies of good and bad management, then the inherent vitality of the industry is prodigious and beyond parallel. No other instance can be cited of an industry that has of itself, without the aid of adequately competent superintendence and management, successfully maintained and improved its position in the face of active and hostile competition. Wages are higher and materials certainly not cheaper, yet the tendency is towards reduced prices, which of itself is evidence of competent management. It is always held, with regard to any individual undertaking, that continued reductions of price are evidence of careful and proper management; and the same holds good collectively.

The gas manager is quite accustomed to be told that he does not move quickly enough in the matter of improvements. Why this should be brought against him I could never understand, but consider it to be principally the opinion of those who look at the profession from outside, and have no personal knowledge of the every-day life at the average gas-works. One never hears of a railway district superintendent being taken to task because the working capacity of the engines is not improved, or of the captain of an ocean liner being blamed because there is not a rapid increase in the speeds or tonnage of the vessels. The answer to a suggestion of this sort would be that both the superintendent and the captain are fully occupied in controlling the every-day operations for which they are responsible; and the same holds good with regard to the gas manager. What would be said if the gas supply of a district suddenly failed in the middle of the evening, and the explanation offered was to the effect that the manager was engaged on some grand scheme for making and supplying gas at 6d. per 1000 cubic feet? None but those who know the ropes of a gas office have any idea of the calls upon the manager's time, the number of personal interviews, the letters he has to write, and the ground he has to cover in the course of a day. Yet there is an impression that he has lots of spare time on hand that might with advantage be applied to the service of his employers, and, indirectly, to that of the industry generally.

There may be room for more pushing enterprise on the part of the manager; but is there any real demand for such among the shareholders and directors? The usual complaint against a really active man is that he moves too fast and spends too much capital; and any tendencies in the way of reconstruction every ten years—taking care of the pennies represented by the saving in working expenses, and leaving the pounds expended on the capital account to take care of themselves—are not likely to find favour. No one following such lines would be able to keep an appointment for a twelvemonth. It must not be forgotten that the gas manager is not a free agent, but is subject more or less to the control of the board of directors, one at least of whom is sure to entertain the conviction that it is not wise to let the manager have everything his own way. Sometimes the financial policy is entirely controlled from the board room, and the manager is obliged to shape his actions in accordance. It usually happens that his progressive policy follows more closely the facilities for raising capital, or the inclination of the board in this respect, rather than his own personal opinions; but it is more usual to find him straining ahead, than lagging behind, The economical facilities offered by increase of business are more evident to him than to anyone else; and we have yet to learn of a practical man, with the choice of either at command, who preferred a stand-still to a go-ahead policy.

Gas managers are usually presented as of two classes only—the competent and the incompetent; the successful man being credited as belonging to the first and the unsuccessful to the second. But the real qualities which go to make up success or failure are not evident upon the surface. There are all sorts of gradations between these extremes; and the unlikely man may take a good place, while one of apparent excellent promise comes out low on the list. Perhaps the most necessary qualification of the present day is that of all-roundness, ability to tackle anything

and everything, which is chiefly dependent upon natural resource and observation, but may be assisted also by a liberal education. The gas manager should be an engineer, chemist, architect and builder, controller of workmen, commercial salesman, business tactician, gas-fitter, accountant, financier, and ever so many other things all under one hat; and one who boasts a moderate ability in respect to most of these subjects may turn out more satisfactory in practice than another who has "taken honours" in respect to one or two, but is weak on the rest. One of the latter class may do excellent work in the laboratory or drawing office, originating schemes of immense value, but find that the whole of his time and ability are thus occupied, leaving the other departments to take care of themselves, with the result that the staff, for want of due control, become negligent, both as to time and material; while financial mismanagement leads to serious losses. Examples could also be given of men who have successfully run gas undertakings by shrewd commercial and financial management, without any technical knowledge worth the name.

The good all-round man may even be very weak on one or two subjects, and yet be a practical success. It is here that the intelligent stoker comes in. If he has kept his eyes open in regard to every other department, he may get better results in running a concern of moderate size than a highly-trained academician who has headed the examination lists and holds a hatful of medals. A man may be strong in technics but weak in finance, or first-rate in both, but yet be so deficient as regards tact, knowledge, and sympathy with human nature as to be constantly embroiled in misunderstandings with his board, his staff, or his customers; and with all other qualifications he may be lacking in physical health and strength. One disadvantage of modern educational facilities is that ambitious but none too robust youths are tempted to overtax their strength. There is no room in the gas profession for men of weak nerves, flabby muscle, and bad digestion, even if they carry a whole "Times Encyclopædia" in their heads. There was a time when the average young man of 25 knew nothing of the doctor, and could hardly recall a day's ill-health; but to-day he is apt to run to the extreme of being an athletic devotee, or a weakly, pallid specimen with eye-glasses, false teeth, and several physic bottles on his shelf. Here the intelligent stoker scores again. Hard but not excessive muscular exercise, simple diet, regular hours of sleep, and no excesses or excitement, are better agents for promoting a sound constitution, strong nerves, easy digestion, and good staying power under worry and strain, powers of perseverance, determination, fighting against long odds, and other qualities that go to make a competent gas manager, than the prevalent conditions at the high-class technical school, or the usual home life of the so-called well-to-do classes. Educate, educate, educate is repeatedly urged; and I do not minimize the importance of the cry. But for all that education is not the one thing needful. Some can manage to make a little of it go a very long way; and whatever the other qualifications may be, the manager must, above all things, be a man and not a machine.

There never was a time when the gas undertaking stood more in need of really a firm, level-headed controller at the helm than it does to-day; and therefore the remuneration offered in return for such services is more than a mere personal question or even a professional matter. It affects the future of the gas industry. The evidence afforded by the advertisement columns of the "JOURNAL OF GAS LIGHTING" shows that, with a few exceptions, and although the returns demanded in the shape of ability, skill, and time to be devoted to the duties have increased, the salary is steadily decreasing. The exceptions are a few of the larger concerns, where the board are sufficiently clever to be able to accurately estimate their own ignorance of technical matters and the need for the best advice obtainable. But it sometimes happens that the board are of a very different calibre—just sufficiently ignorant to form an exaggerated opinion of their own ability to deal with the matters that come before them, and to underrate the value of competent expert assistance. So that while some of our successful undertakings offer substantial salaries, others seem to think that the man who will accept the lowest pay is the one who will in the end do the best for them.

The amount of salary, however, is but one chapter in the story. The services rendered are apt to be rated at the price paid for them rather than at a fair value, and the cheap man is regarded as little superior to a machine. However excellent the results of his working, he gets no credit for it, but is told by inference that any Tom, Dick, or Harry would do as well. There is a tendency, when the remuneration is about the same as that paid to a respectable artizan, to put the general status of the recipient on a corresponding footing, and there is some doubt as to whether the gentleman who acts as the representative of the concern to the employees and the customers should be asked into the library, or condescendingly allowed to sit on the edge of a chair in the hall with his hat and his toes depreciatingly tucked up underneath. The same as regards tenure of office. In the old days, provided a man showed reasonable evidence of knowing what he was about, and being generally competent, he could regard his appointment as secure as long as he had health and strength to hold it, and look for a pension or some substantial consideration at the end. But having once tasted blood by selecting one out of 318 applicants for the honour of working at high-pressure for a bread and cheese pittance, the line is followed up. Some even boldly say that the proper thing to do is to advertise the office about every ten years, or at any rate to make a change on one pretence or another before any claim to recognition on account of long service can be established. Applications for increased recognition of services are shelved by such a policy, however well deserved. Instances could be given of good competent men who have been displaced for no other reason than that they were getting advanced in life, and had too much respect for themselves and for their office to be willing to work at starvation rates. The object held in view by young men is not only the present salary, but the prospects of advance. Can it be said that the gas engineer has any "prospects?" If so, what are they?

It must be remembered that the man who is treated in this way is expected to show a very different front. His own future may be a matter of indifference, but not that of the concern he manages. He must not only secure the present prosperity, but guard the future position, and must deal with the utmost consideration with the various interests with which he comes in daily contact. He is expected to keep the whole staff in a contented frame of mind, and to present an urbane front to all present or prospective customers who call at the office, and to give careful attention to all complaints. He is expected to devote the whole of his time to his duties. And this is literally the case; for he rarely gets a Sunday to himself, and must be constantly on the alert at Christmas and other holiday seasons. All these things are noted by the rising generation; and it is no wonder that they are beginning to ask—as instanced by one of the Junior Associations—whether the position, pay, and prospects of a gas engineer are good enough. The opportunities for getting a post are few; and when obtained it is a bare wage, hard work, poor prospect, and uncertain tenure. Young men of good parts can find more promising openings with good prospect of something more than a competence in other directions, and therefore those of the best order do not join in the scramble to get a managership at a few pounds a week.

The treatment accorded to the manager is to a large extent reflected in the position and standing of the concern in the district. If there is a man of good education, social standing, and address at the head of affairs, fit and able to occupy an influential position in the district, his personality counts for a great deal; and the company is accounted as an important high standing concern. But if its fortunes are left to the charge of a respectable gas-fitter or working foreman, then the undertaking as a whole ranks small and low in the public eye. Especially in smaller towns is it the case that the prosperity of the concern is closely connected with the personal influence of the manager.

(To be continued.)

CHARGING FOR GAS IN AMERICA.

The "Readiness-to-Serve" Method Discussed.

At the last Meeting of the Ohio Gaslight Association, a paper bearing the title of "The Readiness-to-Serve Method of Selling Gas" was read by Mr. W. B. TUTTLE, the General Manager of the Consolidated Gas Company of New York, at Long Branch (N.J.). The system proposed has already* been noticed in the "JOURNAL;" but this will probably not detract from the interest attaching to the author's exposition of it. The following is the text of his paper.

The fact that certain classes of business are more valuable than others, even where the same amount of gas is sold in each case, is probably recognized by the management of every gas company at the present time. The first indication that this fact was appreciated came when the gas-stove was first put on the market on a commercial scale, and lower rates were made for that business than had been in vogue for lighting. The common and accepted argument for the practice was that during the daytime practically no gas was consumed, and that any additional business which could then be taken on required no extra investment in mains, services, or holders, and but a small increase in the capacity. At a later date, the successful development of gas and its application to various industrial purposes, led to the adoption of a still lower rate; the argument being made that, while gas for cooking might be in use five or six hours, that supplied for power would be in use ten or twelve hours.

In order to meet the conditions enumerated above, and also those where it seemed desirable to give special quantity reductions to large consumers, various methods of regulating the charges for gas have been in vogue. These may be divided into three different groups—leaving out, of course, the old uniform rate which calls for the payment of a fixed sum per 1000 cubic feet regardless of the quantity of gas consumed and the purpose for which it is used. These three methods are: (1) The class rate. In this case the different prices which may be charged by the same company for gas will entirely depend upon the purpose for which the gas is used. Thus $1·50 may be charged for illuminating purposes, $1·25 for domestic fuel purposes, and $1 for power or industrial purposes. (2) The discount or reduction on quantity rate. This method is subject to a great many variations; but the principle is that the greater the amount of gas consumed, the less the rate per 1000 cubic feet should be,

* See "JOURNAL," Vol. XCII., pp. 538, 894.

without regard to the purpose for which the gas is used. (3) A mixture of the preceding two methods, in which different rates are given for different classes of business, and reductions are also made in price per 1000 feet as the quantity used increases.

Each of these methods of charging is open to serious criticism. Any discrimination among consumers, based on the use to which gas is put, is sure to cause dissatisfaction and invite litigation. The injustice of such a rate may be illustrated by the following example: Suppose we have a customer who burns gas in a store for five or six hours each night, and directly over him in the flat above we have a consumer who burns gas for domestic fuel purposes only, and who possibly uses gas about the same number of hours each day. The storekeeper may use four times as much gas as the domestic consumer, and still he has to pay a higher rate per 1000 cubic feet for what he uses. It may be argued that the domestic consumer uses the gas in the daytime when there is a small demand, and consequently that he should be charged a lower rate. But, as a matter of fact, during certain months of the year the storekeeper lights up his store before the householder gets through cooking the dinner; so that the hours during which the two burn gas overlap. This incident commonly occurs at the time of the year when there is the greatest demand on the gas plant.

In another instance, we may have a consumer using a gas-engine and receiving his gas at a very low rate, while next door to him we may have another consumer using gas for cooking purposes at a higher rate. The party running the engine may only consume the gas for one or two hours a day, and use a much less quantity than the man employing gas for domestic purposes next door, who uses it several hours a day; but the engine consumer may pay a lower rate for his gas.

By making a class discrimination, the company may lower the price in many cases where the business is already unprofitable, and thus make it still more unprofitable. This has two effects—one to reduce the net earnings of the company, and the other to put off the day when better rates can be made to profitable consumers. For instance, there is not much question that a consumer who uses less than 1000 cubic feet of gas per month is not a profitable one; and yet there are thousands of such consumers who get a low domestic fuel rate. Besides this, the class-rate system demands separate meters for light and fuel, and the cost of reading meters, making out accounts, collection, and interest on meters and connections is largely increased; so that a consumer who might be profitable when only one meter is used may be unprofitable when two are in use.

When the quantity consumed regulates the price, the danger of dissatisfaction among consumers is not so great, as the public are accustomed to give and receive lower prices when goods are handled in large quantities. The company, however, may, under these conditions, charge low rates to consumers who are not very profitable, and refuse them to exceedingly profitable consumers, and as a consequence lose, or fail to get, much valuable business.

As an example, we may have a proprietor of a hall, factory, or other similar building, where gas for lighting is only used for an hour for five or six nights in a month, who gets gas at a lower rate than the industrial consumer next door, who uses perhaps half the quantity of gas that is consumed in the first instance, but who uses it uniformly through the month—taking it slowly during ten hours each day. Manifestly, the latter consumer deserves a better figure than the large one, who only uses gas for a few hours each month. In the first place, a very large meter and service are required, and the sudden addition of the heavy load may seriously affect the pressure in the neighbourhood, and lead to expensive street-main additions; while the long-hour consumer requires but a small investment in mains, services, and meters to supply him.

When the class rate and the reduction for quantity rate are combined, in some cases even more unsatisfactory conditions may exist than where either of the two is used separately. The preceding examples may be extreme cases; but they serve to illustrate conditions which really exist. Assuming, therefore, that none of these methods is just what might be desired, the question of a better one immediately arises.

In analyzing the various expenses which go to make up the cost of producing and selling gas, we find that they may be divided into three groups. The first contains the expenses which are regulated by the quantity of gas required at the time of the greatest demand during the year. This necessarily regulates the size of the works, the capacity of the mains, and even that of the services and meters. The expenses which may be proportioned to this group are caused solely by the quantity of gas required by the consumer at the time of his greatest demand, and are not in proportion to that sold per month or to the number of consumers. Interest on investment should be included in this group. The second group of expenses covers those which are regulated largely by the number of consumers. Certain expenses are incurred in the reading of meters, handling accounts, collecting bills, attending to complaints, &c., which are not proportional to either the quantity of gas demanded at the time of the peak-load, or that used by individual consumers per month. The third group covers expenses of manufacturing and distribution, which are regulated entirely by the amount of gas used, without regard to demand or the number of consumers supplied.

If it is our desire to sell as much gas as possible at profitable rates, it should also be our desire to use a system of charging which can be applied to any individual consumer, and which will give that consumer as low a rate as is consistent with a fair profit. Therefore, each of the foregoing groups of expenses should be considered in making the rate, for if any one of the three charges is omitted, then one or both of the other two must be increased to cover the deficiency; and while this may be readily done in any individual case, no general application can follow which will allow us to sell gas to everyone at as low a rate as is consistent with a fair profit, and still guard against doing business at a loss.

Assuming we find we can cover the expenses occasioned by maximum demand by a charge of $18 per annum per 1000 cubic feet of maximum instantaneous demand, and that we can cover those which are regulated by the number of consumers by a yearly charge of $12 per consumer, and assuming that, if these two items are taken care of, we can sell at 70 c. per 1000 feet and still make a reasonable profit, then the following examples illustrate how the rates for various classes of business work out. In each case the business is considered on a one month basis.

Supposing we have a consumer using gas for lighting, and he demands, at the time of his greatest load, gas at the rate of 100 cubic feet per hour, and uses 5000 cubic feet of gas per month. Assuming that the capacity charge of this consumer is $1·50 per 100 cubic feet demand per month, and the consumer charge is $1 per consumer per month, and that gas is sold for 70 c. per 1000, the man's bill will be $1·50, *plus* $1, *plus* $3·50, or a total of $6, or $1·20 per 1000 cubic feet. Supposing now we have another lighting consumer who has exactly the same demand of 100 cubic feet per hour, but who uses 10,000 cubic feet per month. The same size mains and meter would be necessary as in the first case; and his capacity charge would be $1·50 and his consumer charge $1, and his gas would cost him $7 per month additional—making a total of $9·50, or 95 c. per 1000 cubic feet. Such a consumer is evidently more profitable than the first, and he gets a very much better rate. Yet there is no unjust discrimination, because the first consumer can get just the same rate if he burns the same quantity of gas.

Supposing now we have a consumer who, instead of burning gas for lighting, uses it for a gas-engine, for ten hours a day. His demand is 100 cubic feet, or $1·50, and his consumer charge is $1; but he uses 30,000 cubic feet of gas per month. His bill will therefore be $1·50, *plus* $1, *plus* $21, or a total of $23·50, or 75 c. per 1000 cubic feet. This consumer is evidently a very desirable one for the company, giving the same rate of profit per 1000 cubic feet sold as the other two, yet paying a very much lower rate. Supposing this engine consumer, instead of having 30,000 cubic feet, only uses 5000 cubic feet. The demand charge of $1·50 and his consumer charge of $1 remain the same, and his gas costs him $3·50 in addition—making a total of $6, or $1·20 per 1000 cubic feet. In this case the engine consumer is charged the same rate as the lighting consumer in the first case; and this is just, because he has not used more gas in proportion to his demand.

This way of charging for gas—which has been termed the "Readiness-to-Serve Method"—therefore automatically prevents the granting of low rates to unprofitable gas consumers, and encourages profitable consumers to be more profitable by giving them lower rates as they extend the hours during which they burn gas.

The question of how much the demand charge to each consumer should be, is a difficult one; but, in the absence of a satisfactory limiting device, the total capacity of the burners or the devices for using gas which the consumer may have connected may be used as a basis. Thus burners may be figured as having a demand of 5 cubic feet each, engines as having a demand of 20 cubic feet per rated horse power, and ranges and other appliances may be tested and their demand ascertained. The consumer may not use all his lights or appliances at one time more than a few times during the year, or not at all; but he expects the company to be ready to supply his full capacity at any time he desires to use it, and the company must maintain the necessary equipment to give such a supply if the consumer desires it, and therefore the consumer should pay for the expense that is so occasioned.

It may also be contended that the greatest demand of the various consumers will not come all at once, but that on some consumers it will come at one time of the month or year and on others at another time. But it would seem that any saving from this source is one of the results of the operation of a central plant, and that any profits accruing in this way legitimately belong to the company. If each building operated its individual plant, each plant would have to be large enough to supply the greatest demand, no matter when or how seldom it came.

The application of the "readiness-to-serve" gas-rate can only benefit a limited number of consumers at first, as only those who are using gas for a comparatively long period in proportion to their demand receive any benefit from it. But undoubtedly a very large increase in profitable business would be cultivated, and the average cost would be reduced by the addition of this business; and in the end the other consumers would be benefited accordingly. Besides this, the class of consumers who found this rate profitable would be continually increased as more and more uses are found for gas and more people are convinced that it would pay them to use it.

The effect of such a rate on a company could not but be good; for it would enable the company to take on a large volume of profitable business which perhaps could not be reached by any other rate that could be made, without discrimination, by any

other method of charging, and at the same time it would be a check against taking on unprofitable business at a low rate, which is always possible, and frequently the case, when any of the other methods are in use. In addition to this, a great deal of business would be retained which would be lost through dissatisfaction of the consumers; for where a considerable part of a bill consists of a fixed charge per month, variations of the bills which are due to longer use of gas in some individual month would not be so marked; and the tendency for such variations is to cause complaint. It is well known that a consumer who will cheerfully pay $60 per year on contract, at $5 per month, will complain bitterly when he pays the same amount per annum, but pays $2 in June and $8 in December.

Theoretically, every consumer should pay at least the cost which he occasions the company who supply him, as otherwise he throws on the other consumers some of the expenses of supplying him. But practically this is never the case; and under the old uniform price, "per 1000 cubic feet rate," which has been strongly upheld in the Courts, the profitable consumers carry a large percentage of the small consumers, who are supplied at less than cost.

As a matter of fact, if the "readiness-to-serve" rate were to be universally applied, it would lead to the raising of the price of gas to all consumers who are unprofitable at the present time. This would mean that the price would be raised to a large number of small consumers, which would lead to a great deal of complaint; and the consequences would probably be serious to any company who undertook such a course.

Even where the maximum rate which can be charged for gas is not fixed by law, it would seem that the better plan would be to make the "readiness-to-serve" rate optional with the consumer, and apply it only to such cases which would result in benefiting him—using the rate previously in vogue for all other consumers. Such a method would result in the giving of a lower and better price only to such consumers as were already profitable, and would open up the field of a large amount of business at present unattainable in many cases, while the present unprofitable consumers would not receive any reduction.

It is necessary, before recommending the application of the "readiness-to-serve" rate, to consider the legal aspect of the case. The old uniform meter rate of a fixed amount per 1000 cubic feet, regardless of quantity or time of demand, has been firmly established by usage and by various decisions of the Courts; and while this rate is probably the least equitable to the consumers of any that could be made, yet the fact that it had been many years in use and universally accepted would probably sustain it. The other rates, except the "readiness-to-serve" rate, are something more equitable, but still open to great criticism. For instance, it is hard to justify the giving of a $1 rate for power purposes and a $1·50 rate for lighting purposes, when the gas used for both is consumed at exactly the same time and in the same quantity, which might easily be the case.

It is the intent of the law that every man should be treated alike; and, if the application of the "readiness-to-serve" rate is made optional, any man who desires may avail himself of it, and, further, any man can get his gas at the same rate as any other man, provided his demand is the same and the quantity of gas he burns is the same. It has been held that it is not lawful for a public service corporation to reduce its rate to one consumer, if by so doing it increases the expenses to another consumer. The "readiness-to-serve" rate does not do this, because in its application every expense is covered, and no unprofitable consumer benefits by it. It would seem, therefore, that this rate is more nearly equitable than any other, and therefore probably legal.

The Calorimetry of Volatile Liquids.

A paper on the above subject was recently read by Mr. Walter Rosenhain before the Birmingham Section of the Society of Chemical Industry. The author points out the importance of the question as bearing on the use of volatile liquids for explosion motors and other purposes. Benzol as a tar product would, of course, come under this category; but the author furnishes no figures as to this compound, though the results of experiments on petrol are given. The author's calorimeter is of the class in which the combustible substance is burnt in a current of oxygen under a pressure only slightly higher than that of the atmosphere. In practice, a weighed quantity of the liquid to be tested is absorbed by a pellet of pure, dry, and somewhat compressed, cellulose, the calorific value of which is separately determined. For heavy mineral oils, and comparatively non-volatile liquids, this method was found to give accurate results within ½ per cent. With very volatile liquids, however, the loss from evaporation from the time of transfer from the balance to the calorimeter occasioned serious errors. To obviate this, the pellet was, after saturation, wrapped in thin tin-foil, which easily burnt away with the rest of the pellet, and whose heat value could be deducted. In the discussion which ensued, the general opinion appeared to be that, in the case of volatile liquids, efficient tests could be more readily made by impregnating air with the material and subsequent combustion of the impregnated air in a Junkers calorimeter.

Alfreton has lost a well known and greatly esteemed townsman in the person of the late Mr. Joshua Roberts, J.P., who was at one time Chairman of the local Gas Company.

A NEW FLICKER PHOTOMETER.

Some time ago, in the "Zeitschrift für Instrumentkunde," Herr Walter Bechstein, of Berlin, described a new form of flicker photometer, of which he gave the following particulars:

The instrument is so constructed that the one field of vision is alternately illuminated, equally all over its surface and for an equal period of time, by both the lights that have to be compared. It is reversible, so that the standard light can be placed at either end of the bar, and inequalities in the two diffusive reflecting surfaces be thus eliminated. It can be used for the measurement of light issuing at any angle from the radiants. It is cheap, and is not subject to vibration, as none of the moving parts oscillates, and therefore it can be employed on a lightly-built bar.

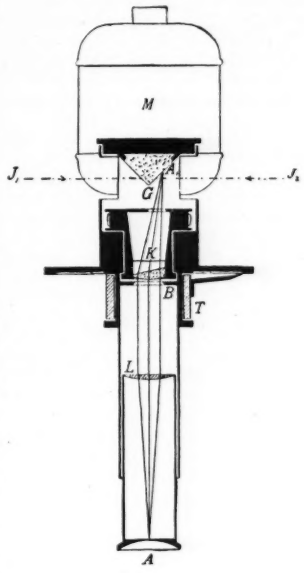


Fig. 1.

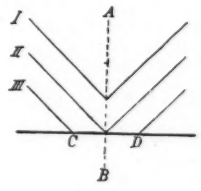


Fig. 4.

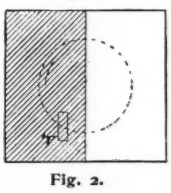


Fig. 2.

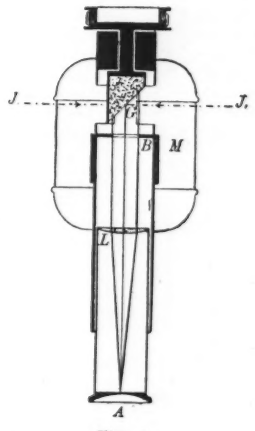


Fig. 5.

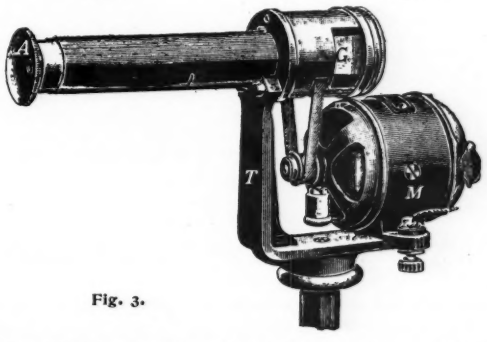


Fig. 3.

The general construction of the optical arrangements is shown in section in fig. 1. The prismatic lens K is carried at a distance equal to its focal length from the diffusive reflector G, made of gypsum; and the plano-convex lens L is at a distance equal to its focal length from the observing aperture A. B is a fixed stop, limiting the field of vision. The aperture A may be either circular or slit-shaped; in the latter case, as K is rotated, its image travels over the reflector in the manner represented in fig. 2. The reflector can be rotated upon its axis; stops being provided which limit its motion to an angle of 180°. This movement allows either of its surfaces to be brought opposite the standard light, and also forms a means of adjusting the instrument accurately. If K is revolved to such a position that the image of the point of the reflector appears in the aperture A (especially when the latter is viewed through an eye-piece), a rotation of G itself should leave its image unmoved. When G is properly set, the whole field of vision is illuminated with light from the source J_1 on the left side, and with light from the source J_2 on the right side, for every half-revolution of the lens K. When the photometer is required for the measurement of light proceeding in directions other than the normal from the radiants, the entire instrument is made to turn within the sleeve T of its support.

The external appearance of the optical arrangements is shown in fig. 3 (without the fitting last mentioned), where M is a small direct-current motor of about 1-60th horse power for 110 or 6 volts. If required, an alternating current motor can be employed instead; but the author finds that an electrically-driven motor is better for photometric purposes than a train of clockwork, which costs nearly as much. The speed at which K is made to revolve must be adjusted to suit each individual observer and the degree of difference in colour between the two lights under test; but when the most favourable velocity has been ascertained, it should be kept constant. This is very easily managed with an electrical drive. Accuracy in comparison is the greater the smaller the area of the field of vision over which flickering ceases, but is almost impossible if it does not cease anywhere, as is the case when the speed of revolution is too low. The effects of different speeds of revolution are shown diagrammatically in fig. 4, where the dotted line A B is the optical centre of the photometer, the ordinates the intensities of the flickering, and the abscissæ the positions on the bar. Curve I represents too low a speed, Curve II. is the best, and Curve III. too high a speed of revolution. When the speed reaches III., no flickering is to be detected over the whole area C D, and the proper position can only be judged by interpolation.

In order to show the concordant results obtainable with this form of flicker photometer when employed in the comparison of lights of different tints, Herr Bechstein gives a table of the single readings made by three different observers, two of whom were previously unacquainted with the flicker system. The lights under test were a pair of paraffin lamps of equal size and burning steadily. They were carried on the photometer at a constant distance apart of 1400 millimetres. In the first set of readings, both lamps were permitted to evolve their ordinary white light; in the second, the rays from one were passed through a distinctly green glass; and in the third, one set of rays were tinted ruby red and the other pale blue. The results may be summarized in the following manner; the figures being the distances in millimeters between the optical centre of the instrument and one of the lamps. The three observers are designated by the letters A, B, and C; B being the only man possessing previous experience, and A being evidently a person regularly over-estimating the intensity of red illumination.

—	Both White.			One Green, One White.			One Red, One Blue.		
	A	B	C	A	B	C	A	B	C
Maximum .	704	704	704	480	487	485	637	631	628
Minimum .	697	696	695	472	478	478	626	610	617
Mean . .	699·6	700·1	698·6	475·4	482·6	482·0	632·2	619·2	623·0
Mean error . per cent.	0·94	0·77	1·09	1·15	1·13	0·76	1·5	3	1·4

A very simple arrangement of the flicker photometer is shown in fig. 5; G being a right-angled prism of gypsum rotated upon the optical axis of the instrument by the motor M. Inequality of reflection is impossible in this type, because the same face of the prism is alternately presented to the two radiants; but the apparatus is less suitable for the measurements of light coming at abnormal angles from the sources. Inequality in reflection can be avoided in the instrument shown in fig. 1 if the reflector G is replaced by a cone which participates in the revolution; or, more simply, if the revolving portion carries a small disc of gypsum at the point A_1, which during rotation forms parts of the reflecting cone.

AN ENDURANCE TEST OF A GAS-PRODUCER.

In previous issues of the "JOURNAL," reference has been made to the Fuel-Testing Committee of the United States Geological Survey. It appears that they have put forward certain claims in regard to the power-producing efficiency of coals used in a gas-producer and a gas-engine; and they have given rise to some doubts as to there being any real justification for them. It was therefore decided by Professor R. H. Fernald, who has charge of the Survey's gas-producer plant at St. Louis, to undertake an "endurance" test. It was commenced on the 28th of March and continued till the 21st of April—a period of 24 consecutive days—and the results were given in a recent number of the "American Gaslight Journal."

The test was made in the identical plant in which all the Government fuel tests have been conducted since October, 1904; and 150 tons of screened coal were placed at the disposal of Professor Fernald. The installation consisted of a Taylor pressure-producer gas plant of 250-horse power capacity, and a vertical three-cylinder single-acting Westinghouse gas-engine of 235 brake-horse-power capacity, operating on producer gas. The engine was belted to a 175-kilowatt Westinghouse generator. The electrical energy developed during the test was dissipated through a water rheostat, designed to readily control the load on the engine. The coal was broken to about 3-inch egg size, and delivered to the charging-floor of the producer by a belt conveyor. It was charged to the producer at intervals varying from 25 to 30 minutes. The weight of each charge was 150 lbs. The hopper through which the coal passed to the producer was a double seal one with belt and cover plate. The producer was charged by hand. The bell was so designed that the coal was evenly distributed over all portions of the fuel bed, which was kept in uniform condition by hand poking from the top about every half hour.

The gas left the generator at an average temperature of 644° Fahr., and passed through a water-seal dust-collector and then to the scrubber. From there, it flowed direct to a centrifugal tar-extractor, which removed the greater portion of the tar left in the gas. It was then delivered direct to the holder. No further attempt was made to purify it, since experiments at this testing plant have proved conclusively that sulphur carried in the gas has no injurious effect upon the engine. From the holder the gas passed through a meter having a capacity of 30,000 cubic feet per hour, on its way to the engine cylinders.

During the entire test, calorimetric determinations of the heat value of the gas were made every twenty minutes, and volumetric analyses every two hours. The average heat value of the gas for the entire run was 156·1 B.T.U. per cubic foot. The gas contained no hydrogen disulphide, 9·2 per cent. of carbon dioxide, no oxygen, 0·4 per cent. of ethylene, 20·9 per cent. of carbon monoxide, 15·6 per cent. of hydrogen, 1·9 per cent. of methane, and 52 per cent. of nitrogen. Observations relating to the tar extracted during the test are of special significance, as it has often been stated that no plant which separates the tar mechanically could run more than five or six days without shutting down. The total tar extracted during this test amounted to 14,950 lbs., or about 143 lbs. of tar for every ton of coal burned in the producer. The tar did not contain more than 10 per cent. of water. The average of six analyses of the coal showed 14·68 per cent. of moisture, 30·98 per cent. of volatile combustible, 42·93 per cent. of fixed carbon, and 11·41 per cent. of ash, including 1·33 per cent. of sulphur. The number of British thermal units per pound of dry coal was 12·343.

As the plant was designed for general test purposes, the passages through which the gas was obliged to pass were far more tortuous than would have been the case in a plant installed merely for the production of power. In going from the dust-collector to the scrubber, the gas was forced to make three right-angle turns, and pass through a water-seal valve, traversing a distance of about 20 feet instead of 3 feet, as would have been the case in an ideal arrangement. Owing to the deposit of tar in the water-seal valve, the test was brought to a close after 24 days. The ashes were removed about once every 48 hours, without shutting down the plant. This was accomplished by simply reducing the pressure under which the producer was operated, and running the plant on the suction basis during the hour required for removing the ashes. The men worked with entire ease and comfort during this period.

The engine ran in perfect order at all times during the period of 24 days, and at the end of the test it was found in unimpeachable condition. Even a cleaning was not necessary. The producer plant was also found in excellent condition. Owing to the fact that final calibrations of some of the instruments used in the test had not been received, the official horse power carried during the test and the dry coal required per brake-horse-power per hour could not be given. The approximate figures showed, however, that an average horse power of 227 was used during the test, and an average of 1·39 lbs. of dry coal consumed per brake-horse-power per hour.

The Gas Section of the Irish Exhibition of 1907.

Following up the information given in last week's "JOURNAL" as to the steps which are being taken to organize the Gas Section of the Irish International Exhibition, to be held in Dublin next year, a meeting of the Preliminary Committee of Contractors was held under the chairmanship of Mr. Francis T. Cotton last Wednesday. Among other resolutions was one which will result in Mr. James Helps being asked to give, at a later date, of his valuable experience and assistance to the exhibitors; and another seeks to enlist the sympathy of Mr. Charles Hunt, the President-Elect of the Institution of Gas Engineers. The Chairman informed the Committee that the Council of the Institution would bring forward for consideration at the annual meeting the question as to the advisability of holding the next meeting in Dublin (allusion is made to the matter in our Editorial columns); and thereupon it was unanimously agreed that the general meeting of gas contractors should be postponed to the 27th inst. The Chairman was also asked to confer with Mr. Hunt as to the best means of forming an Advisory Committee. [In our reference to the Exhibition last week, it was stated that the building to be devoted to the Gas Section would be 20 feet high. This was a mistake. It should have been 50 feet high.]

Dr. F. L. Teed, who was the Gas Examiner at the Millbank Street Testing-Station of the London County Council, has relinquished his appointment; the station, as was mentioned in the "JOURNAL" last week, having now been closed. Mr. A. J. Scott Pinchin, another of the Council's Gas Examiners, has resigned.

REGISTER OF PATENTS.

Vertical Retorts.—Woodall, H. W., and Duckham, A. M'D., of Bournemouth. No. 11,956; June 7, 1905.

The patentees claim: A vertical, or substantially vertical, retort for the carbonization of coal, having longitudinal ribs projecting from its outer surface of such depth that they abut against the setting, or against the corresponding ribs of adjacent retorts, when the retort is in place.

In their specification, they say that vertical retorts have hitherto been supported in the flues that surround them by bricks, tiles, or the like, set a certain distance apart in the brickwork-setting, at right angles to it, and abutting against the retort. They have, however, found that this mode of supporting the retort is hardly sufficient; for when the retort becomes hot, it is liable to give way at the parts between the supports. Moreover, in order that the supports may be as efficient as possible, they must have relatively considerable breadth; "so that they act as a serious impediment to the draught of the flue."

By the present invention, they construct the retort, which is usually of fire-clay, with a number of longitudinal ribs projecting from its outer surface, and of such a depth that when the retort is in place in the setting they abut against the latter or other retorts. In this manner, they both strengthen the wall of the retort and afford supports for it in the brickwork setting. Moreover, according to their number, the ribs subdivide the space within the setting into a number of separate flues, thus facilitating the heating of the retort.

Fig. 1.

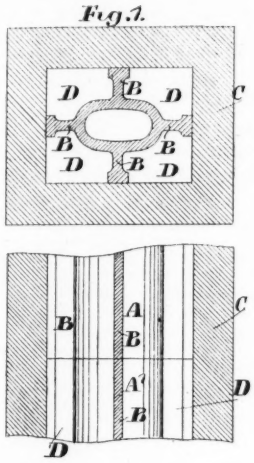


Fig. 2.

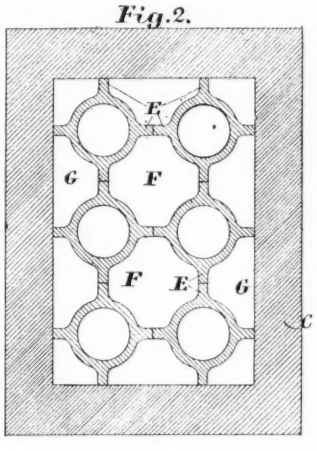


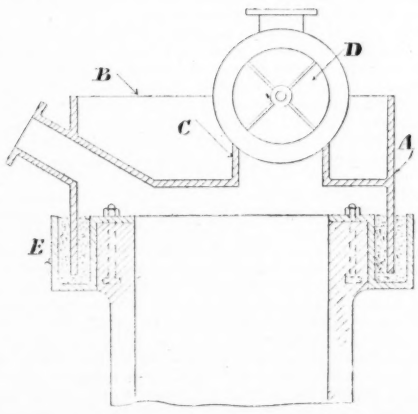
Fig. 1 is a horizontal and vertical section of a rectangular setting containing a vertical retort of eliptical cross-section; and fig. 3 is a horizontal section of a rectangular setting containing a number of retorts of circular cross-section.

In fig. 1, each section A A^1 of which the retort is built up has four ribs B in diametrically opposite pairs, of such depth that when the sections are in place each rib abuts throughout its length against the corresponding wall of the setting C. The space contained by the setting is thus subdivided into four flues D.

In fig. 2, the ribs E of adjacent retorts abut against each other, so that flues F are formed by each group of four retorts, besides the flues G formed at the walls of the setting.

Vertical Retorts.—Woodall, H. W., and Duckham, A. M'D., of Bournemouth. No. 12,289; June 13, 1905.

This invention is designed to overcome certain disadvantages that have been found in the use of the vertical retort described in the patentees' specification No. 16,497 of 1903—see "JOURNAL" for July 5, 1904, p. 26.



In that specification there was described a vertical retort for the carbonization of coal wherein the coal is put into the retort through a gas-tight feeding device connected with the top of the retort. But a disadvantage of the construction has been found, in that the top section of the fire-clay retort is apt to be cracked, owing partly to the vibration transmitted through the shoot and cover from the driving mechanism of the feeding device, and partly to the strains set up by unequal expansion and contraction. Another disadvantage is that the shoot and feeding device are not as cool as they should be in order to ensure their proper working.

The vertical section of the improved form shows the cast-iron cover A (of elliptical or other appropriate form in plan), cast or built with a deep flange B, forming a tank or jacket within which the feeding device D and the shoot C therefrom are partly contained. By causing water to circulate through this tank or jacket, the shoot and feeding device are kept effectively cool.

The lower edge of the cover rests in a trough E corresponding in form with the cover and bolted to the top of the retort. A gas-tight joint between the trough and the cover is made by a packing of sand or other suitable material. The lower edge of the cover may rest on this sand, as shown, so that vibration is deadened. By this arrangement comparatively little vibration is said to be transmitted through the cover to the retort, "and the ill-effects of the unequal expansion and contraction are mitigated." Moreover, the cover is easily removed when the inside of the retort requires attention.

Vertical or Inclined Retorts.—Woodall, H. W., and Duckham, A. M'D., of Bournemouth. No. 12,789; June 20, 1905.

This invention relates to a setting for vertical or inclined retorts for the carbonization of coal whereby the retorts may be heated in sections.

For this purpose the flue in which the retorts are set is subdivided by a number of horizontal or inclined partitions into chambers communicating with each other, and each having inlets controllable by valves or dampers. When all are wholly or partially open, combustible gases and air are admitted to each of the chambers, and every section of the retort is then heated directly by the flame from the combustion of the gases. When, however, one or more of the dampers is wholly or partially closed, the corresponding section or sections are heated wholly or partially by the products of combustion from the chambers above or below, accordingly as the draught is downwards or upwards, and therefore less highly heated.

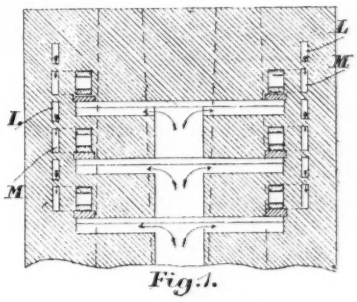


Fig. 1.

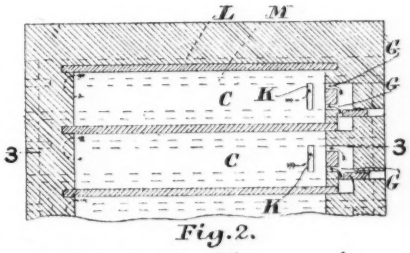


Fig. 2.

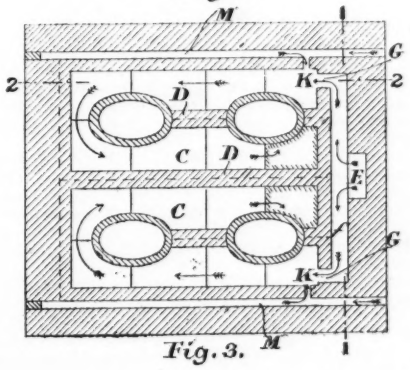


Fig. 3.

Fig. 1 is a vertical section through the gas-canal of a retort-setting on the line 1—1 of fig. 3; fig. 2 is a vertical section on the line 2—2 of fig. 3; and fig. 3 is a horizontal section on the line 3—3 of fig. 2.

The setting contains four retorts, two in each flue. The flues have a number of horizontal partitions subdividing the flue into chambers C; while vertical partitions D serve to compel the gases that pass through each chamber to travel around both retorts. The gas-canal E has branches at the level of each chamber, into which the branch opens through one or more ports G controlled by a damper. Each chamber is in communication with that below it by a port. The ports are all "so arranged that the greatest possible travel is obtained for the flue gases around the retorts." The air for combustion, admitted to each

chamber through the port K, becomes preheated by passing through passages L and M in the setting on its way to the port. The passages L are controlled by valves, not shown. When all the dampers and passages are open, combustible gas and air enter each chamber, as indicated by the arrows, and travelling round the retorts in company with the products of combustion from the chamber above (the draught being downwards in the present instance) pass into the chamber next below, and so on through the whole series of chambers to the flue leading to the chimney stack. If, however, the damper and passages corresponding with any one chamber are closed, the sections of the retorts in this chamber are heated solely by the products of combustion from the chamber above, the temperature of which "may be reduced by judicious admission of air through the passage L."

Gas-Retort Discharger.—Ludbrook, S. W., of Hornchurch, Essex, No. 14,980; July 21, 1905.

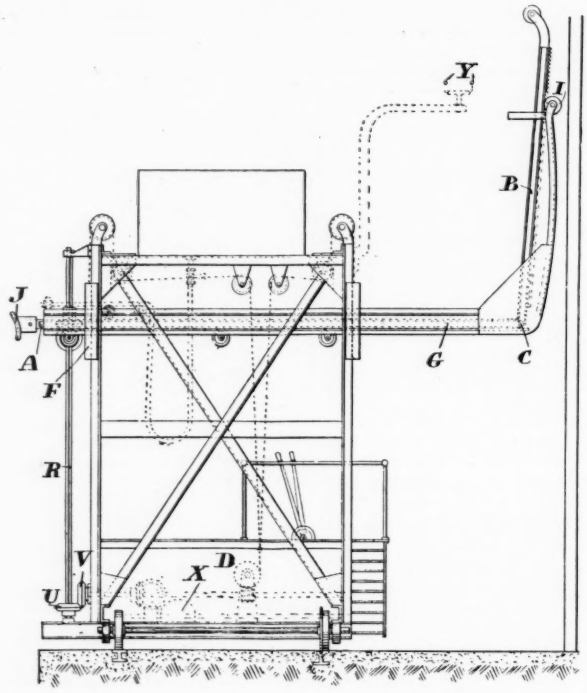
This retort-discharger or pusher-bar is constructed of H iron or steel riding in a track, and in two parts hinged together—one end carrying the pusher-head or drawing tool, and the other end carrying a roller for riding up a vertical track. It is provided with a toothed rack or its equivalent on the underside for movement by a gear wheel operated from some motor; and the discharger is capable of being moved in front of any retort to be cleared of the coke.

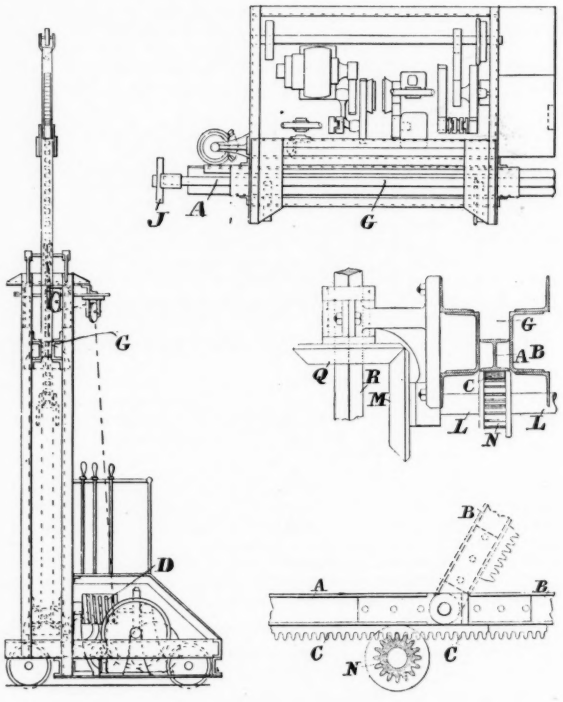
As shown, the pusher-bar is formed from two pieces A B, hinged together so that when the two pieces are horizontal they form a complete straight bar. The underside of the bar is provided with a toothed rack C or its equivalent, and such bar is situate between channel iron walls carrying guides movable up and down the framework of the machine proper. The walls are also connected at intervals so as to form a box with open top and bottom and provide a straight track G for the proper movement of the pusher-bar. This track lies across the machine and alley; and the end furthest away from the retort is continued in a vertical direction and is provided at its upper part with a shrouded wheel or roller I, against the shrouds of which the bar B rides when assuming its full vertical position, as hereafter described.

The front end of the bar A carries the head J for pushing the coke out of the retort, or it may be a drawing tool when the coke is to be drawn out.

The guides or the track at the front of the machine carry two brackets—one having bearings for an axle L carrying a bevel pinion M and a shrouded toothed wheel N, which gears with the rack C—the shrouds carrying the pusher-bar A B. The bevel wheel M meshes with a bevel wheel Q situate on, and slidable along, a square driving shaft R running from top to bottom of the machine; the bevel wheel Q being held to the other bracket by a sleeve on its end. The square shaft R is supported in bearings from brackets at the top and bottom of the apparatus, and is provided at its lower part with a bevel pinion U meshing with a bevel pinion V operated through gear from a prime mover X—in this case an electric motor, which obtains its power from overhead wires Y through the trolley and wires and the usual switch-board.

In operation, one of the two handles shown is moved to allow the apparatus to travel along the floor rails on the retort staging, so as to bring the pusher-head J in position before a column of retorts. The pusher-head is now in position in the vertical line, and to position it to clear a retort (say the top one), another handle is operated and the drum D revolved to raise the track G and the pusher-bar A B until the head J is in proper position. Then another handle T is operated to connect the gear from the motor to drive the bevel pinion V, and this through the bevel pinion U; the rod R actuating the pinions Q M and N and moving forward the pusher-bar A B into the retort, pushing the coke before it to fall out the other end. During the travel of the bar A,





the section B is riding downward over the roller I; and after leaving the roller I, the roller on the end of the section B will ride down the track and finally come into the horizontal position with the other section—the gear wheel N then coming into operation on the section B to move both forward.

On the completion of the movement of the bar A B, the gear can be stopped by the operator or automatically thrown out. The handle is now operated to reverse the direction of travel of the pusher-bar, and when the top roller reaches the track H it rides up; and when the section A is fully moved home, the section B will have assumed the position shown, and the mechanism stopped or automatically thrown out of operation.

The track G and push-bar and the gear are now lowered to the next retort; the gear wheel Q sliding along the rod R, and the operation resumed.

To draw the coke from the retort, the pusher-bar (carrying a drawing tool) is first positioned to push the tool over the layer of coke in the retort, and then slightly dropped to allow the tool to get behind the coke when the withdrawing takes place.

High-Pressure Gas-Lighting Relief and Pressure Valve-Boxes.—Glover, T., of Queen Victoria Street, E.C. No. 16,562; Aug. 15, 1905.

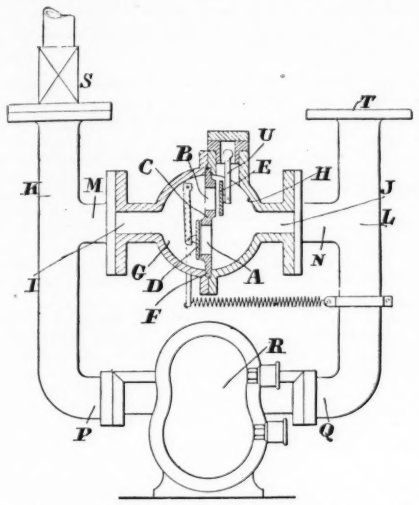
This particular arrangement of relief and pressure valves used in connection with a blower or pump in a high-pressure incandescent gas-lighting system has for its object the production of the various parts of the apparatus in a more expeditious and economical manner, as hitherto in high-pressure lighting, the bye-pass valve and pressure valve have been each fitted to separate valve-boxes—"necessitating extra expenditure in fitting up, and not so handy in use."

To arrange the relief or bye-pass and pressure valves in one box, openings A B are formed in a circular plate C, one above the other; and their valves D E are so arranged as to close the openings on opposite sides. The plate C (preferably made with a peripheral beading on its extreme circumference on each side of the plate) is located as a diaphragm in position between two semi-globular castings G H, formed with recesses corresponding to the beading; and these are of such width and shape as to receive a ring of soft india-rubber, so that when the castings and the diaphragm are bolted together in their rough state, without any machining, they will be rigid and gas-tight under high pressure.

The inlet and outlet branches of this valve-box are connected to branch pipes K L, with three ways—the middle one M N on each side being connected to the valve-box G H; the ends P Q to the blower or pump R; and the ends S T to the low-pressure and high-pressure service respectively. The valve E is hung loose from the pivoted arm U fitted within the casing H; and the valve D is hung by an arm fitted inside the casing from a bearing, this carrying a lever outside the casing controlled by a spring, or the lever may be weighted.

Before putting the compressor to work, the gas is turned to the inlet S, and passes down the pipe K through the branch M and through the valve E, which, under the action of gravity, hangs slightly clear of its seating, and then along the branch N and outlet T to the burners—thus enabling the lamps to be lit at ordinary pressure. The compressor R, on being put in motion, draws the gas down the pipe K, through the branch P, and forces it, under pressure, through the branch Q and along the pipe L to the burners. The excess of pressure in the pipe L over that in the outlet-pipe K forces the valve E on its seating;

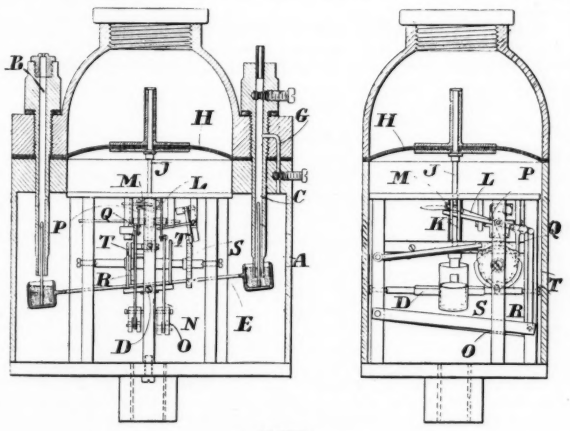
and while the compressor is in action, the valve E acts as a regulating valve. But so soon as the gas in the pipe L exceeds a certain pressure (this pressure being determined by the spring or a weight on the arm),

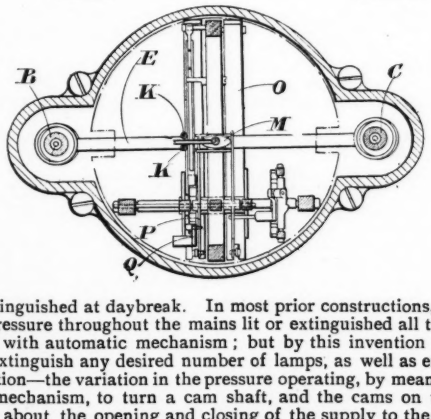


the valve D opens, and being forced off its seat, allows the excess of gas to pass back again to the inlet-pipe K—"thus ensuring a constant pressure at the burners."

Gas Lighting and Extinguishing Mechanism.—Bonniksen, B., of Coventry, and Berridge, T., of Leamington. No. 4377; Feb. 22, 1906.

It has hitherto been proposed, the patentees point out, to utilize a variation in pressure in the gas-mains to effect the synchronizing of electric clocks at any desired frequency. In some cases gas-lamps are lit and extinguished by varying the pressure in the supply mains; and consequently a variation in the pressure for synchronizing purposes would, unless steps were taken to the contrary, upset the working of these automatically-regulated lamps. The present invention therefore has for its main object to provide gas lighting and extinguishing mechanism effected by variation in pressure, in which change of pressure for synchronizing purposes will have no effect on the lamp. Further, in most towns a number of the street and other lamps are extinguished at a certain hour (say, midnight); the remaining lamps





being extinguished at daybreak. In most prior constructions, a variation in pressure throughout the mains lit or extinguished all the lamps provided with automatic mechanism; but by this invention it is possible to extinguish any desired number of lamps, as well as effect synchronization—the variation in the pressure operating, by means of convenient mechanism, to turn a cam shaft, and the cams on the shaft bringing about the opening and closing of the supply to the lamp, so that it is possible, by varying the construction and profile of the cams, to obtain the results above stated.

The mechanism (as shown) is contained within a chamber consisting in a main portion attached to a base plate and having a detachable top-piece. The chamber is fixed upon the gas supply-pipe. A pipe B leads to the burner—of any suitable construction and arranged in any convenient manner. The pipe C forms the igniting bye-pass commonly employed in incandescent lamps. At D (on a suitable framework) is pivoted a rocker E, carrying mercury cups at its ends. These are arranged in the same plane as the pipes B and C, and are adapted to be brought up so as to close the mouths of these pipes, as will be seen. It will be clear that the chamber being filled with gas, this will find its way up the pipes B and C, provided their mouths are left open by the cups. This opening and closing is effected automatically by means of the mechanism about to be described; and it will be seen that when the supply-pipe B is open, the bye-pass C is closed, and *vice versâ*. In addition to the bye-pass C, there is a small bye-pass G, controlled by a set screw, the object of which will be described later.

A diaphragm H carries a spindle adapted to receive weights of any convenient type; and guided in the top of the framework is a spindle J, carrying at its top a plunger. This spindle has fixed transversely to it a pin which lies between two vertical guide-rods K, projecting downwardly from the top of the framework. Pivoted to the framework is a lever L, which carries two pins, between which lies a floating disc M, which serves as a "simple universal connection" between the spindle J and the lever L, such that, when the spindle J is depressed, the lever L is turned on its pivot. The rear end of the lever is connected by a link N to a weighted lever O pivoted to the framework at its other end. The tendency of this weighted lever is always to keep the pins on the lever L in contact with the disc M. The pins are adapted to bear on the top of the second lever P, which is suitably pivoted, and connected by a link to a weighted lever. The links and the levers are arranged side by side, and may be duplicates of one another. The lever P carries a depending pawl Q, which engages the teeth of a rachet-wheel R in such a manner that, when the lever P moves under the action of the weighted lever, the pawl Q turns the rachet-wheel and its shaft S. This shaft carries a pair of cams, one on either side of the centre of the mechanism, and consequently of the pivot D, which consists of a cross-piece attached to the centre of the rocking lever E. The cross-piece carries projecting arms, which bear against the cams as shown.

With the cams shaped as shown, the lamp is adapted to be extinguished at (say) midnight, synchronizing taking place a few hours afterwards; while some of the other lamps on the same mains are to be extinguished at daybreak. Changes of pressure therefore—for synchronizing purposes, and at daybreak—will have no effect as regards the lighting or extinguishing of this particular lamp.

The operation, assuming the parts to be in the position shown, is as follows: On first increasing the pressure within the chamber the diaphragm H is raised. Under the influence of the weighted levers O, the plunger and the spindle J follow the diaphragm, and the lever P is turned on its pivot. The pawl Q moves downwards, and rotates the cam-spindle S. The cams being in engagement with the pivotal cross-piece D on the rocking lever E, the lever is rocked out of the position shown, and brought into a new position in which the pipe B is covered, and the pipe C uncovered. The lamp is now extinguished, and the main bye-pass C opened up ready for future lighting purposes. After a short time, the pressure in the mains is returned to the normal, and the diaphragm H falls under the weights carried on the spindle. After a few hours, pressure is again increased; and the diaphragm H is raised for synchronizing purposes, which may be effected in any convenient manner, and forms no part of the present invention. This second raising of the diaphragm causes rotation of the cam-spindle S in the manner described; but the cams T are, at the part at present in engagement, with the arms, concentric, so that no movement is imparted to the rocking lever E; and this and its cups remain stationary. Similarly, at daybreak, when the remaining lamps on the mains are to be extinguished, the pressure is again increased and reduced; but the cams T being still concentric, no movement is imparted to the rocking lever E. Later on, as at night time, when it is desired to light all the lamps, the pressure is increased, and the cam-shaft rotated. This time a suitable swell on one of the cams and recess on the other cam engage the arms, and the rocking lever E is moved over on its pivot, returning this to the position shown, in which the bye-pass C is cut off and the supply-pipe B opened up. After this, the same cycle is gone through, as will be understood.

For those lamps which have to be kept alight till daybreak, the only alteration is in the cams T, which are differently shaped, so as to cause the rocking lever E to remain stationary for the first two increases of pressure after the lamp has been lit, instead of for the first two increases after it has been extinguished, as in the construction under consideration.

APPLICATIONS FOR LETTERS PATENT.

11,742.—Pitts, H. H., "Incandescent burners for acetylene and other gases." May 19.

11,743.—Pitts, H. H., "Gas-generators." May 19.

11,774.—Townsend, G., and Moore, W. G., "Obtaining power from the water supply of town reservoirs and the like." May 21.

11,779.—Tweedie, R. O., "Mantle protector." May 21.

11,780.—Beswick, W. H. & R. E., "Joints for mains." May 21.

11,801.—Normansell, T R., "Meter cash-box." May 21.

11,874.—Maschinenbau-Anstalt Humboldt and Schmick., H., "Gas-turbines." May 21.

11,901.—Thompson, D., "Gas and water valves." May 22.

11,904.—Campbell, H., "Gas-producers." May 22.

11,925-6.—Allison, C. A., "Distilling coals." A communication from the American Chemical Eduction Company. May 22.

12,010.—Record, J. W., and Bevis, H., "Cost-indicator for meters." May 23.

12,024-5.—Electrical Improvements, Ltd., and Hacking, A. E., "Electrically lighting up gas-lamps." May 23.

12,033.—Yarrow and Co. (Bolton), Ltd., Yarrow, M., and Haworth, W. R., "Joints of pipes and mains." May 23.

12,060.—Harriss, G. M., "Recording meter readings." May 23.

12,076.—The Economic Safety Gas Company, Ltd., and Fowler, C. C., "Carburetted air." May 23.

CORRESPONDENCE.

[We are not responsible for the opinions expressed by Correspondents.]

Gas Companies and the Coal Tar Colour Industry.

SIR,—I have received a pressing invitation to join the Committee of the "Perkin Memorial and the Jubilee of the Coal Tar Colour Industry Fund," and to identify the South Metropolitan Gas Company with the movement, on the ground that gas companies must have materially benefited by the sale of tar. Respect for Dr. Perkin as a man, and admiration for his scientific work, made it difficult to refuse. But I have refused, both for myself and the two Gas Companies with which I am connected; for these innumerable excuses for begging are intolerable. The objects seem to be to do honour to Dr. Perkin, and to provide a research fund for the Chemical Society to play with; and this spoils the whole thing. A great and good man's name is used as an excuse for begging. Of course, it was the first-named object, and not the research fund, that has induced so many influential men to give their names to the movement. I have heard of very little good that has come from research funds; the great inventions and discoveries are usually the work of individuals acting generally under the stimulus of a worthy ambition, or it may be the hope of gain. Other discoveries come through the purely business methods of research and experiment, of which, perhaps, the most striking and successful illustration is to be found in the great German tar colour industry, whose motive is pecuniary gain. The proposal to honour Dr. Perkin by having his portrait painted, could be carried out with ridiculous ease by the 151 distinguished gentlemen who form the General Committee. This, to my view, would be the proper thing to do; but to make a general appeal, and in particular to gas companies, seems quite out of place.

Gratitude is supposed to be due in acknowledgment of past favours, though it has been cynically said to be a sense of favours to come. It so happens that the gas companies for many years have derived no benefit whatever from the wonderful and valuable coal tar discoveries; and, so far as can be seen, there is nothing in the future to inspire gratitude of the inferior kind. When I was young in the gas business—before any of these great discoveries were made, and tar was distilled simply for the naphtha, heavy oil, and pitch—the price obtained by the South Metropolitan Company was about 1d. per gallon; and it is about the same now. This is the value of tar as simple fuel. The South Suburban Gas Company are now selling part of their tar at this price for that purpose; and they are unable to obtain any more from the tar distillers. The South Metropolitan Gas Company some years ago had a customer to whom they sold tar for fuel at 1¼d. per gallon; but the distilling price went up about ½d., and that customer was unwisely lost. We gas makers should cultivate the fuel trade for tar—and it would be well worth our while to do so—by fixing 1d. per gallon as the standard price, and thus give encouragement by assuring a continuous supply, at a fair figure, to railway companies for their locomotives and to other firms, to use tar for fuel. The same may be said for road making. I believe at 1d. per gallon tar would be used largely for these purposes; and if we could, as is very probable, thereby dispose of (say) half our make, we should, especially if the leading gas companies on the Continent followed our example, be in a position to obtain a good price for the remainder.

To show what is possible in this direction, I give the example of anthracene, which, when first used as a substitute for madder, was sold at 4s. 6d. a unit (it is now only 1½d.), and drove madder out of cultivation. The West Ham Gas Company sold their tar in, I think, 1873 at 4d. per gallon, and the South Metropolitan Company the same year got 3½d., the price of both being previously about 1d. This great rise was almost entirely due to anthracene. Now, 1d. a gallon on tar is 1d. per 1000 cubic feet off gas. Since then, we have produced more anthracene than the market could use. The German colour makers hold about a five years' stock; and anthracene is now at the miserable price of 1½d. per unit, and not worth making. It would, perhaps, have been better for us had the discovery never been made, and the madder growers of Turkey would not have been deprived of their means of living.

On this point, reference may be made to artificial indigo, which is said to be probably the latest and most significant triumph for the colour industry—possibly from the colour industry point of view; but what good is it likely to do? It has done, and will probably do, much more harm to India by cutting off a source of revenue, and, what is far worse, depriving many of its poor inhabitants of their means of living. We shall certainly not get any more for our tar.

I should not have troubled you with this letter on the small matter of the Perkin Memorial Research Fund, but I do, with all seriousness, suggest for the consideration of all gas authorities the advisability of cultivating a large demand for tar for fuel and for road making; and for these purposes the price must be reasonable, and must not fluctuate.

May 29, 1906. GEORGE LIVESEY.

The Cheapest Gasholder.

SIR,—I am surprised to see that Mr. Herring adheres to the antiquated notion that the comparative cost of structures should be "based solely on the weight of material employed," regardless of design and other controlling influences. According to Mr. Herring's theory, the more material thrown away in the construction of a gasholder, or any other structure, the cheaper it is, because the "cost per ton" is, of necessity, less in a heavy than in a light object of similar construction. If, for instance, a gasholder is made with cast-iron columns 2 inches thick when 1 inch would be ample, according to Mr. Herring's standard the former would be the cheaper, because the "cost per ton" of the completed article would be less. The reason for this scarcely needs explanation to practical engineers; but to the "students" Mr. Herring refers to, it may be necessary to point out that the labour does not increase in the same proportion as the weight of the structure. To take a purifier for example; the plates may be only ⅝ inch thick; but if they were double the thickness, the labour in making the patterns and castings would not be much greater. The total cost of the raw material would be doubled in the latter case, but that of the labour and other charges would remain practically the same in both cases. Hence a purifier with plates ⅝ inch thick would cost more per ton of material used, but much less per 1000 cubic feet capacity, than the one having plates 1¼ inches thick.

Mr. Herring has missed the point of the discussion in the "JOURNAL." It was not, Which is the cheapest gasholder judged by any and every standard? but, Which gasholder has actually cost the least per 1000 cubic feet capacity? The statement was made that the cheapest gasholder on record cost £5 per 1000 feet. I simply pointed out that the cheapest was under £4 per 1000 feet. There was no question as to whether the "capacity" standard was a correct one or not.

Certainly the "capacity" standard, with all its faults—and it has many—is a far truer standard than mere weight or cost per ton of metal used, because the latter exalts the worst possible designs into being the best. The veriest tyro can then, by piling on sheer weight, make a very cheap structure judged by the "cost per ton" theory, whereas it is impossible for him to do so, without courting disaster, if the cost per 1000 cubic feet capacity is taken as the standard.

I repeat that good design is what gas companies should seek, as it covers everything else; and for Mr. Herring to discredit this, and laud the mere spendthrift of material (which is the logical outcome of his theory), will be a surprise to all engineers.

The chief factors which influence the comparative cost of gasholders are the following:—

1.—Total capacity of holder.
2.—Design, which includes proportion of height to depth, number of lifts, &c., as well as details.
3.—Controlling influence of tank on design.
4.—Cost of raw materials and labour (manufacture and erection).
5.—Carriage from contractors' works to site where structure is to be erected.
6.—Special difficulties, or the reverse, due to nature of site—accessibility, elbow-room, &c.
7.—State of trade among contractors for gas plant.
8.—"Rings," or trade combinations, for artificially inflating or keeping up prices.

One might easily write much upon every one of these points, showing its influence on the total cost; but this would open up a much wider field than can be dealt with in ordinary correspondence.

As to No. 3, however, I may say that Sir George Livesey has called my attention to the fact that if it had been possible to have made the 12½ million holder at East Greenwich with four deep lifts instead of with six very shallow ones, the cost per 1000 cubic feet would have been very much less than it was. To have made the tank any deeper would have involved pumping the Thames dry. Hence the controlling influence of the tank should be taken into consideration when making exact comparisons.

So far, however, as a rough-and-ready guide is concerned, the "cost per 1000 cubic feet capacity" serves the ordinary purpose; whereas Mr. Herring's "cost per ton of metal" theory would mean squandering money to satisfy a fallacy.

I conclude, as I began the correspondence, by saying that "mere heaviness neither means strength nor cheapness." Good design covers everything, as it includes the consideration of weight and all the other factors enumerated above.

71, *King William Street, E.C., May* 31, 1906. F. S. CRIPPS.

Amendment of the Gas-Works Clauses Acts.

SIR,—The perusal of Sir George Livesey's interesting letter in your last issue, recounting the result of the parliamentary struggles of the South Suburban Gas Company, has led me to consider whether the present would not be an ideal time for getting an amendment of the Gas-Works Clauses Act.

Some gas undertakings have recently secured valuable parliamentary concessions such as: 1. The adoption of Carpenter's No. 2 "Metropolitan" argand burner. 2. The abolition of the sulphur clauses. 3. The adoption of the half-candle range in illuminating power.

The industry still requires: 1. Freedom to adjust prices to meet the competition of suction gas and other competitors. 2. The Mirfield clause relating to power gas supplies. 3. A uniform standard illuminating power of (say) 12 candles.

Sir George Livesey states in his letter that the parliamentary struggles of the South Suburban Gas Company have cost £10,000. This shows the ruinous cost of individual effort.

Is not the time ripe for combined action on the part of the whole gas industry of the country to get the points previously enumerated, and possibly some others, embodied in a fresh amendment of the Gas-Works Clauses Act?

In Sir George Livesey, we possess a matchless parliamentary champion; and the Institution of Gas Engineers have already initiated and carried out to a successful issue two notable benefits—viz., the opposition to the "London" argand burner with a fixed rate of consumption, and the opposition to the proposed Home Office regulations on Private Railway Sidings. Why should not the Institution organize the introduction of a fresh Gas-Works Clauses Act? All gas undertakings would benefit, and all should cheerfully help to bear the cost; and if Sir George would take the matter in hand with his usual energy, backed up by the whole industry, success would, I think, be assured.

Mr. Carpenter's paper at the coming meeting of the Institution of Gas Engineers would form a fitting opportunity for the discussion of this question.

If such a General Act as I have suggested were to become law, gas undertakings would only require additional financial powers, in the majority of cases, which could be obtained through Provisional Orders. This would save vast expense, and uniformity of testing and of conditions would enable results to be accurately compared; whereas, as things are at present, confusion will be worse confounded with some

undertakings working with Carpenter's new standard burner, while others are restricted to the old "London" argand of thirty years ago.

Wakefield, June 1, 1906. H. TOWNSEND.

[As will be seen by the report to be presented at the annual meeting of the Institution of Gas Engineers on the 19th inst. (see p. 631), the question of the expediency of taking steps for obtaining an amendment of the Gas-Works Clauses Act has already been brought before the Council, and referred to the Parliamentary Committee for consideration and report.—ED. J.G.L.]

Laindon and District Gaslight, Coke, and Water Company.

SIR,—I have read with interest your remarks upon the above and kindred companies, and am glad to see you have taken up this matter. The formation of these "Wild Cat" companies must do injury to the legitimate gas-share market, and cause a good deal of distrust among investors.

I see that the Directors of this precious Company have already rushed through the allotment of shares; but I should think that shareholders would have a good chance, on application to the Court, of getting their names taken off the register if they act upon the information contained in your articles.

As affording some interesting information respecting the manner in which these companies are formed, I annex a few particulars extracted from the register at Somerset House respecting the "Water-Works Lighting and Power Investment Corporation, Limited," which Corporation is, according to the prospectus of the Laindon Company, the promoter of, and vendor to, that undertaking. This delectable "Corporation" was registered on April 11 last, and has a capital (nominal) of £2000 in £1 shares, of which £7 only has been subscribed. The object of the Company is stated to be "to raise money by the issue of shares and to invest the moneys so raised in the purchase of, or otherwise to acquire and hold, any investment." Fancy what important investments they will be able to acquire with their £7 of subscribed capital!

But it will be readily seen what is the true *raison d'être* of the Company from the following extract from an agreement which is also filed at the Registration Office. This is as under: "Agreement, dated April 30, 1906, between Edmund Eaton, of 99, Cannon Street, E.C. (called the Vendor), of the one part, and the Water-Works, Lighting, and Power Investment Corporation, Limited (called the Company). Whereas the Company *is about to become indebted to the Vendor* in the sum of £250 for various monies advanced and work done, and he has agreed in respect of the said sum *to accept payment in fully-paid ordinary shares* of £1 each. Therefore it is agreed that the Vendor will accept payment from the Company by the allotment to him of 250 ordinary shares of £1 each in the capital of the Company, such shares to be allotted as fully paid."

From the above it is easy to perceive who is the real Promoter of, and Vendor to, the Laindon and District Gaslight, Coke, and Water Company, Limited.

I enclose my card and remain,

May 30, 1906. GAS INVESTOR.

Municipal and Company Ownership.

The itinerary of the Commission for the National Civic Federation of the United States, for the purpose of inquiring into the working of municipally and company owned tramway, gas, and electricity undertakings, includes the following arrangements.

June 1.—Glasgow electric lighting.
June 4.—Glasgow Gas-Works.
June 6.—Newcastle District Electricity Company.
June 7.—Newcastle Gas-Works.
June 8.—Newcastle Electricity Supply Company.
June 11.—Manchester electric lighting.
June 12.—Sheffield Gas-Works.
June 14.—Leicester Gas-Works.
June 15.—Birmingham Gas-Works.
June 16 and 17.—Liverpool electricity.
June 20.—Manchester Gas-Works.
June 22 and later days.—London tramway, gas, and electric undertakings, with a trip to Norwich and possibly Bristol.

Previous references to the visit and investigations of the Commission have appeared in the "JOURNAL."

Crediton District Council and the Gas Company.

At a meeting of the Crediton District Council on Tuesday last, the Clerk read some correspondence which had passed between the respective agents of the Council and the Gas Company with regard to the capital of the new concern. It was stated that at a recent meeting of the Council an agreement was signed by the Chairman and Mr. Schultz (on behalf of the Company) to the effect that the capital to be raised under the Bill before Parliament should not exceed £17,000, and that not more than 5 per cent. interest should be paid till the charge for gas was reduced below 4s. 6d. per 1000 cubic feet. Under the Bill, however, powers were asked to borrow one-third more than £17,000. The Council's agent contended that this was not a compliance with the contract; and he suggested that a further petition should be presented with the view to getting the Bill blocked in the House of Commons. A letter was read from the Chairman of the Council (Sir Redvers Buller) approving of this course. After some discussion, a petition was sealed and ordered to be forwarded to the London Agents for presentation. The Clerk also reported an offer which had been made for the lighting of the town by the Gas Company. It was thought to be a satisfactory one; but its acceptance was postponed until the next meeting, lest it should weaken the Council's opposition to the Bill.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following further progress was made with Bills down to the rising of the House on Tuesday for the Whitsuntide recess:—

Bills brought from the Commons, read the first time, and referred to the Examiners: Cheltenham Gas Bill, Derby Gas Bill, Pontefract Corporation Bill, Rochester, Chatham, and Strood Gas Bill, South Suburban Gas Bill.

Bills read a second time: Gas Orders Confirmation Bill (No. 2), Gas and Water Orders Confirmation Bill.

Bills reported, with amendments: Gas Companies (Removal of Sulphur Restrictions) Bill, Portsmouth Water Bill, Southampton Gas Bill, Truro Gas Bill.

Bills read the third time and passed: Cumberland Electricity and Power Gas Bill, New Mills Urban District Council Bill, Newtownards Urban District Council Bill, North-East Lincolnshire Water Bill.

Bills Royal Assented: Accrington District Gas and Water Board Bill, Carlisle Corporation Bill, Kidderminster Gas Bill, Mirfield Gas Bill, Thornton Urban District Gas Bill.

Petitions against the Ascot District Gas (Electric Lighting) Bill have been presented by the South-West Suburban Water Company and the Berks County Council.

The Bacup Corporation Bill, Cardiff Gas Bill, Epsom and Ewell Gas Bill, Great Yarmouth Water-Works and Lowestoft Water and Gas Bill, Huddersfield Corporation Bill, and Uxbridge Gas Bill have been referred to a Select Committee, consisting of the Earl of Lauderdale (Chairman), Earl Bathurst, Viscount Falmouth, Lord Kilmain, and Lord Kensington; to meet on Tuesday, June 26.

HOUSE OF COMMONS.

The following further progress was made with Bills down to the rising of the House on Wednesday for the Whitsuntide recess:—

Lords Bills read the first time and referred to the Examiners: Cumberland Electricity and Power Gas Bill, Newport Corporation Bill, Newtownards Urban District Council Bill.

Lords Bill read a second time and committed: Glamorgan and South Wales Water Bill.

Bill reported: Local Government Provisional Orders (Gas) Bill.

Bills read the third time and passed: Cheltenham Gas Bill, Derby Gas Bill, Pontefract Corporation Bill, Rochester, Chatham, and Strood Gas Bill, South Suburban Gas Bill.

A petition in favour of the Sutton District Water Bill has been presented by the Sutton Urban District Council, one against the Glamorgan and South Wales Water Bill by the Monmouthshire County Council, and another against the Crediton Gas [Lords] Bill by the Crediton Urban District Council.

The Kingston-upon-Hull Corporation Bill, Sutton District Water Bill, Poole Corporation Water Bill, Water Provisional Orders Bill, and Wolstanton United Urban District Council Water Bill [Lords] have been referred to a Select Committee, consisting of Sir Henry Kimber (Chairman), Mr. Bethell, Mr. Condon, and Mr. Lever; to meet on Tuesday, June 12.

On Monday last week, Mr. Nield (Ealing) asked the President of the Board of Trade whether he would enlarge the terms of the order of reference on the London County Council (Electric Supply) Bill, now before a Select Committee, so as to admit evidence and report upon the question of the cheapest and best method of generating electricity in bulk so as to create a general demand for its use for lighting, heating, and power purposes, and also upon the practicability of establishing a central authority for large areas to deal with such supply, on the lines of the Metropolitan Water Board. Mr. Lloyd-George said the Committee had been considering the Bill for twelve days, and it was too late for him to suggest any alteration of the terms of the reference, even if he thought the terms were not sufficiently wide. He had no reason for thinking that the Committee would be precluded from considering the points mentioned by the honourable member.

UNOPPOSED BILLS.

Local Government Board Provisional Orders (Gas) Bill.

The Unopposed Bills Committee of the House of Commons, presided over by Mr. ALFRED EMMOTT, on Tuesday gave further consideration to the above-named Bill, which had been adjourned by the Committee, as reported last week (p. 589).

Mr. BOYCE, for the Local Government Board, explained that the Committee would be acquainted with the contents of the memorandum with which he had supplied them with regard to the proposal to substitute another site for gas-works by the Liverpool Corporation, in place of the one mentioned in the schedule. Since the last meeting, they had carried out the directions of the Committee that they should give notice to all the owners of property within 300 yards of the proposed new site. The owners had already given their consent; but the Town Clerk also proposed to serve the owners and occupiers within this area with notices informing them of the alteration. Notices would also be inserted in the newspapers.

The CHAIRMAN remarked that he did not think there would be any difficulty in the House of Lords, because Lord Onslow had been conferred with on the matter.

Mr. BOYCE pointed out that there were two other Orders in the Bill; one being that of the District Council of Arlecdon and Frizington,

where the illuminating power was 14 candles and the price of gas 5s. per 1000 cubic feet. Nothing went to the rates until the price to the private consumers had been reduced to 4s.; and there would be no charge on the rates until the actual price was paid. The other Order was that of the Urban District Council of Marsden, which was for amending an Order of 1886 giving them power to purchase additional lands for gas purposes, and granting them further powers. The price of gas under the Order of 1886 was 5s. 6d. per 1000 cubic feet, and the illuminating power was 15 candles; and there was the usual provision that nothing should go to the relief of the rates until the price had been reduced to 4s., and nothing was taken from the rates until the maximum price was reached. It was a sort of sliding-scale.

The Bill was ordered to be reported, with amendments.

LEGAL INTELLIGENCE.

SEQUEL TO AN OLDHAM GAS EXPLOSION.

At the Oldham County Court last Thursday, His Honour Judge Bradbury delivered a reserved judgment in an action in which the Oldham Brewery Company were the plaintiffs; the defendants being the Corporation of Oldham and Messrs. Crisp and Hartley, the Conservative candidates at the last Parliamentary Election. The claim was for £81 16s. for damages caused to premises belonging to the plaintiffs—the "Slip Inn" and the shop No. 36, Bottom o'th' Moor, by an explosion of gas which occurred in adjoining premises, No. 38, which were in the occupation of Messrs. Crisp and Hartley.

When the case was heard some weeks ago, Mr. F. W. Roe-Rycroft, who appeared for the plaintiffs, said that Messrs. Crisp and Hartley had hired the premises No. 38 for election purposes, through their Election Agent; and on Jan. 8, a request was made to the Gas Manager to connect the gas. Between three and four o'clock that afternoon, one of the Corporation inspectors went to the premises and connected the gas; and he apparently discovered that there was a leakage in the fittings. Instead of following the usual practice, and doing what he (Counsel) submitted he ought to have done—disconnect the gas—the inspector made the connection to the main, but turned it off at the meter. It was the practice of the Corporation to refuse to connect gas unless and until any leakage had been made right. The inspector appeared to have reported to the Election Agent's clerk the fact that the fittings were leaking; and the election people sent for a plumber. It was dark; and while the plumber's man was looking for the leak, the inspector came to the shop again and said that the leak was in the back room. The plumber and the clerk went there and found a gas-pipe in the centre of the ceiling with an open end, from which gas was escaping. The plumber's man, standing on a ladder, closed the end of the pipe. The clerk, standing on the floor, held a lighted candle; and when the end was closed up he handed the candle up to the plumber, and then the explosion occurred. The ceiling and the roof were blown off; and the gable wall was blown out, falling upon the plaintiffs' premises and causing the damage which was the subject of the action. As part of his case against the Corporation, Counsel argued that there was negligence on the part of their inspector in leaving the gas connected, knowing that there was a leakage. He read a report on the occurrence by the General Manager (Mr. Arthur Andrew) presented to the Gas Committee, which concluded as follows: "This case shows how necessary it is that no one but the Corporation servants should be allowed to disconnect or connect the meters. If we had strictly adhered to the rule which we usually observe, there would have been no explosion in this case." With regard to the responsibility of Messrs. Crisp and Hartley, Counsel submitted that they were the occupiers of the premises; and it was their duty to so use their occupation as not to injure their neighbours. The premises had been unoccupied for some time; and the election people took no steps to ascertain whether the fittings were right or not. This was negligent. There was also probably negligence on the part of the plumber who turned the gas on at the meter; but he was the servant of the Election Agent. It was agreed that, subject to the question of liability, the damage should be put at £75.

The witnesses for the plaintiffs were two plumbers (who spoke to the practice of the Corporation in regard to these matters) and the apprentice who was sent to attend to the leak. Ernest Pennington said he had known of cases where, after connection, the Corporation officials discovered a leakage; but they had then always disconnected the gas. He had never known of the gas being connected by the Corporation when they were aware of a leakage. The connection being left on by the Corporation, he assumed it was a slight escape. The man who attended to the leak (who was in witness's employ) must have been able to smell the gas when he got on the ladder, as there was more at the top of the room than at the bottom—there not being enough lower down to cause an explosion. In cross-examination, witness said he would not have taken a light to the top of the room; it was madness to do so. The doors and windows ought first to have been opened, to allow a draught of air through the room. Any gas-fitter who knew his business would take that course. The apprentice who was sent to attend to the escape said there was nothing to indicate to him that there was sufficient gas in the room to cause an explosion. He was just about to take the candle from the clerk, to see if he had closed the pipe properly, when the explosion occurred. Charles Newsome, another authorized plumber, said the practice was for plumbers to repair fittings at houses, and the Corporation were then told; and they connected the meter up. He had known several cases where the gas had been connected and an escape discovered, and then the gas disconnected by the Corporation. When they went to repair an escape, the Corporation were not told to disconnect the gas; but the plumber turned it off at the meter, and effected the repair. In new property the Corporation also tested the fittings before connecting the gas. He had never known the Corporation test fittings in the case of old property; but he had known their inspector, after making the connection and discovering there was a leak, disconnect again. There was no risk in repairing a leakage if the proper precautions were taken; and every gas-fitter should take these precautions. They could always tell by the smell whether or not it was a slight escape.

On behalf of the Corporation, Mr. Rhodes submitted that there was no duty on them, statutory or otherwise, to inspect the fittings. His Honour said there was some evidence of a practice to disconnect if there was a leak discovered; but he presumed that Mr. Rhodes would say that, if they did this, it depended upon the circumstances in each case, and in this case the Corporation man turned the gas off at the meter and reported the matter, and afterwards visited the shop again and found an authorized plumber in charge. Mr. Rhodes replied that that was so. He then called the Meter Inspector, who said he told the people that he had merely turned off the gas at the meter, and that if they got a plumber it would be all right. When they found a leakage in the fittings, it was the general practice to disconnect the meter. Cross-examined, he said he could smell the gas, and was of opinion that it was a large escape. He would have disconnected the meter, but for the fact that the premises were needed that night. Mr. Arthur Andrew, the General Manager, said the inspector took the proper course, seeing the urgency of the matter. He was quite justified in keeping the connection on and telling the agents to get a plumber at once. The Corporation did not make a practice of repairing fittings. In answer to Mr. Rycroft, witness admitted that if the meter had been disconnected the explosion would probably not have occurred.

Mr. Byrne (Counsel for Messrs. Crisp and Hartley) having intimated that he had no witnesses to call,

Mr. Rhodes addressed the Court for the Corporation. He said it was their duty to connect up to the main when required to do so by the tenant; but it was not for the Corporation to test the fittings inside the house.

His Honour, however, pointed out that they were handling a dangerous substance, which might cause mischief. They were under an obligation to see mischief was not caused by their gas. They ought to take care that the escape did not cause damage when they knew of one. One way was to disconnect the gas; and if they had done this, they would have been perfectly safe.

Mr. Rhodes replied that the Corporation servants did, as a matter of practice, disconnect after discovering a leakage; but this was a matter between the Corporation and their servant, not between the Corporation and the public, or any other third party. It was not a statutory obligation on the Corporation; but it was an extreme precaution which they took against danger where the circumstances of the case admitted of so doing. The inspector, after discovering the leakage, cut off the gas by turning it off at the meter, and told the tenants that they must send for a plumber at once. The master plumber said that if proper steps had been taken, there would have been no explosion. He submitted that on these facts there was no evidence of negligence on the part of the Corporation.

His Honour said it seemed fairly obvious that the real cause of the whole mischief was the negligence of the youth who was sent by Pennington to repair the leakage. Probably it would be said that he was the tenants' agent; and the tenants' reply would be that they called in a presumably competent man, and if he did not do his work properly the tenants were not to blame—that they had done all that was reasonably to be expected of them. A possible answer to this was that, though *prima facie* the employment of a competent contractor would excuse the tenants, there was an exception to this law. While a dangerous state of things existed, the tenant did not get rid of his obligation to the third parties because he employed a competent person. The question was whether that applied in this case. There was no doubt that the plumber was the person responsible for the explosion. The question was whether the tenants could, under the circumstances, get off on the plea of employing an independent and competent contractor.

Mr. Roe-Rycroft argued that the rights of persons owning adjoining property were not to be infringed because the case happened to be one of urgency.

His Honour said that there were two courses open to the Corporation inspector—he could either disconnect or he could turn the gas off at the meter and put the premises in the hands of a competent plumber. The Corporation said that they had taken the latter course, and under the circumstances they were not responsible. This seemed to be the position Mr. Roe-Rycroft had to meet. Supposing they did that which to an ordinary reasonable person would ensure safety, how could liability be placed upon them?

Mr. Roe-Rycroft argued that there was a duty on the Corporation to take all reasonable precautions. It had been their rule to disconnect under these circumstances; and in this case they did not. The course they adopted might excuse the Corporation from liability to Messrs. Hartley and Crisp, but not to third parties. If the negligence of the two defendant parties contributed to the damage, the plaintiffs were entitled to judgment against both; and he submitted that if the Corporation had done their duty, the negligence of the plumber would not have caused the explosion. The Corporation had themselves set up a standard of what was reasonable precaution in these cases; and in the present instance they had departed from that on the plea of urgency. There also existed a duty on the tenants that they should, before applying for the gas to be connected, see that the fittings were right; and the mere calling in of a man—even a competent man—when it was dark, did not excuse them. The rule of law was that persons in possession of fixed property must use it as to cause no nuisance to others, whether by themselves or by any contractors or servants whom they might bring on.

Mr. Byrne emphasized the point that the tenants had employed an independent and competent contractor, who was authorized by the Corporation to do such work. So far as any care on the part of the tenants was required, they had exercised it. The work which they placed in the plumber's hands was quite simple; and, if properly done, it was attended by no risk. This covered the whole of the tenants' liability in the matter. There was no danger until a foolish fellow turned the gas on. At the time the tenants called him in there was no danger at all, for the gas was turned off. The employment of the plumber was not to deal with a nuisance or a danger which then existed, but to take such steps as would prevent a nuisance or danger

arising when the gas was turned on. To do this, they employed a competent man; and the work was perfectly safe if properly done.

In giving judgment, His Honour found that the explosion was caused by the negligence of the apprentice in failing to clear the room of gas before introducing the light, and that the Corporation were not liable. He remarked that it was said that the Corporation were negligent in leaving the connection when the fittings were defective; but, under the circumstances, this failure to disconnect did not amount to negligence, and was not the approximate cause of the explosion. He therefore found that the Corporation were not liable. With regard to the other defendants, where a person in possession of real property caused work to be done there in which in the natural course of things injurious consequences to his neighbours must arise, unless the work was carried out with reasonable skill and care, a duty was cast upon him to see that the work was so carried out; and he could not get rid of the responsibility by delegating the performance of the duty to a third person, although such person was an independent and presumably skilful contractor. There was another ground on which the personal defendants were liable. Where a person for his own purposes brought on to his premises anything likely to do mischief if it escaped, he must keep it at his peril; and if he failed to do so, he was liable for any damage it might do. Gas was such a source of danger. It was no answer for these defendants to say that the escape and the explosion were due to the negligence of the gas-fitter. They were bound to keep the gas in at their peril. On both grounds, therefore, he held Messrs. Hartley and Crisp liable; and his judgment was, therefore, against them. The Corporation were allowed £20 costs.

Stay was granted for three weeks, to allow time for consideration as to the advisability of an appeal.

A HOUSE OWNER AND HIS WATER SUPPLY.

A Company Fined £100.

At the Tredegar Police Court recently, a case was heard in which the Rhymney and Aber Valleys Gas and Water Company were summoned by David Williams, a contractor, for neglecting to cause water-pipes to be laid and water to be brought to dwelling-houses erected by him at Aberbargoed. A month ago the case came up, and was then adjourned, on the suggestion of the Chairman, so that efforts could be made to effect a settlement; but the endeavours proved abortive.

Mr. J. SANKEY appeared for the complainant; Mr. W. W. MEREDITH represented the defendants.

Complainant's case was that he had lost the rental of eleven houses for seven months, as the Bedwellty Council refused to certify them as fit for habitation until after water had been laid on. The Company, it was alleged, had insisted that the houses should be connected to a main in a street some distance to the rear of the buildings; but this would entail increased cost compared with joining a main in the front street, which the Company had failed to provide.

Mr. MEREDITH, for the defence, submitted that it was unreasonable to expect the Company to lay a special main to supply the houses, as they abutted upon a street in which a main had already been put down. The Company had brought the water to the backs of the houses, and it was open to the owners of the property to obtain a supply by making the necessary connections on that side. After the houses were completed, the complainant served the Company with the usual notices to make the connections; but they were not in order, and others were subsequently served. The complainant originally intended to connect the houses from the back street, and cut the necessary trenches; but subsequently he decided to compel the Company to lay a main down the street in front, where there were no other houses than his own.

The CHAIRMAN remarked that the main would have been a splendid asset for the Company.

Mr. MEREDITH said the Directors were not prepared to take the course proposed as a matter of principle, and having regard to any cases that might arise in the future. He went on to argue that a limited liability concern, like the Company, had no right to go into a private street; and the one on which the houses fronted had admittedly not been taken over by the District Council. It was a street which had not been "dedicated to the public use" within the meaning of the Private Streets Act; and he submitted that the Company could not be compelled to take their main into it, leaving out of consideration the question of whether or not it was reasonable to ask them to do it. Dealing with the question of cost, he said there was a difference of 30s. per house between laying on the water from front or back.

Mr. *A. R. Cawley*, the General Manager of the Company, said it was the Directors' desire to afford every facility for people to have water. But, leaving the Directors out of consideration, he personally would not do what was asked by the complainant, because there was already a main in the street at the rear of the houses. He admitted, however, that it was farther off.

Charles Marshall, an employee of the Company, stated that last January complainant had the trenches cut right up to the back wall of the houses; and all that remained to be done was to put in the pipes.

Mr. SANKEY submitted that the case had practically become an undefended one. It had been uncontradicted that the Company, upon a capital outlay of £14 2s., would have an annual income of £7 3s. for water-rates in the front street. The whole question in this case was whether or not the street had been "dedicated to the public use"; and he contended that to all intents and purposes it had.

After a brief conference in private,

The CHAIRMAN said the Bench had come to the conclusion that the Company, by not laying down the main, set at nought the doctrine of the Act. A penalty would be imposed of £100, with £31 10s. costs.

Mr. MEREDITH intimated that probably there would be an appeal.

The Richmond Gas Stove and Meter Company, Limited, have recently held exhibitions in, and canvassed, the districts of the following Companies, with very satisfactory results in all cases: Accrington, Bridlington, Burnley, Douglas, Liverpool, Magherafelt, Portrush, and Tonbridge.

MISCELLANEOUS NEWS.

LIGHTING OF PARLIAMENT STREET AND WHITEHALL.

Gas v. Electricity.

At the Meeting of the Westminster City Council on Thursday—the MAYOR (Major-General Lord Cheylesmore) presiding—the Works Committee submitted the following report and recommendation.

We have had before us tenders received from the Gaslight and Coke Company and the Westminster Electric Supply Corporation for the lighting of certain lamps in Parliament Street and Whitehall, in consequence of the failure of the Scott-Snell Self-Intensifying Gas-Lamp Company to perform their contract.

The tender of the Gas Company is not in accordance with the specification of the City Engineer; the Company having made various alterations and reservations with regard to the clauses as to the time of completion of works, rates of wages and hours of labour, tests of lighting, indemnity of Council for injuries or accident in consequence of works, and number of burners, &c. The Company also request that, if their tender is accepted, they shall be permitted to place their gas-compressing plant in the Parliament Street subway. The Company tender for the supply of lamp-columns and lamps where none now exist, for the sum of £17 per lamp, and for the maintenance and lighting of the whole of the lamps for £15 1s. per lamp per annum.

The Westminster Electric Supply Corporation submit two tenders. One is for the supply and fixing of flame arc lamps and lamp-posts, to remain their property, and for the maintenance and lighting of the lamps on the following terms: No charge to be made for the first 18 months, and the charge for the remaining 3½ years to be the same as charged for the arc lamps in the St. George, Hanover Square, district. The charge would be as follows, supposing the contract commenced on the 1st of June:—

June 1, 1906, to Dec. 1, 1907, 18 months	Free.
Dec. 1, 1907, to Dec. 1, 1908, 12 months, £22 per lamp, less 3 per cent.	£21 6 10
Dec. 1, 1908, to Dec. 1, 1909, 12 months, £22 per lamp, less 3½ per cent.	21 4 7
Dec. 1, 1909, to Dec. 1, 1910, 12 months, £22 per lamp, less 4 per cent.	21 2 5
Dec. 1, 1910, to June 1, 1911, 6 months, £22 per lamp, less 4½ per cent.	10 10 2
Total cost per lamp for five years	£74 4 0
Average price per lamp per annum, £14 16s. 10d.	

The Corporation's alternative tender is for the supply and fixing of "Oriflamme" 9 ampère flame arc lamps and lamp-posts for the sum of £42 10s. per lamp, and for the lighting and maintenance of the lamps on the following terms: The charge would be as follows, supposing the contract commenced on the 1st of June:—

June 1, 1906, to Dec. 1, 1907, 18 months	Free.
Dec. 1, 1907, to Dec. 1, 1908, 12 months, £17 15s. per lamp, less 3 per cent.	£17 4 4
Dec. 1, 1908, to Dec. 1, 1909, 12 months, £17 15s. per lamp, less 3½ per cent.	17 2 7
Dec. 1, 1909, to Dec. 1, 1910, 12 months, £17 15s. per lamp, less 4 per cent.	17 0 10
Dec. 1, 1910, to June 1, 1911, 6 months, £17 15s. per lamp, less 4½ per cent.	8 9 6
Total cost per lamp for five years	£59 17 3
Average price per lamp per annum, £11 19s. 5d.	

The lamps to be lighted and maintained free for the first 18 months, and for the remaining 3½ years for the sum of £17 15s. per lamp per annum, less the rebate in force at the time in the St. George, Hanover Square, district.

The Electric Supply Corporation state that their offer to maintain the lamps for the first 18 months free of cost is made because the system of lighting by flame arc lamps is new, and they wish to gain practical experience of the best type of lamp; and that they believe the candle power would considerably exceed that specified, and the street be more efficiently lighted, with 15 flame arc lamps than with 20 gas-lamps of 900-candle power.

By the first tender of the Electric Supply Corporation, therefore, the average price per lamp per annum for maintenance and lighting is £14 16s. 10d., the lamps and posts remaining the property of the Company; while by their second tender the average price per lamp per annum is £11 19s. 5d., the City Council paying for the installation at the rate of £42 10s. per lamp.

The average price per lamp per annum quoted in the first tender of the Electric Supply Corporation is lower than that quoted by the Gas Company for the contract period—viz., five years; but if the tender of the Corporation were accepted, and at the expiration of the contract period the Council desired (as they no doubt would) to continue to light the streets in question by means of electric light, the price per lamp per annum would be £22, less the rebate in force at the time in the St. George district. If, therefore, the cost of lighting during ten years is taken, instead of five years, the tender of the Gas Company would be the cheaper.

We have also taken into consideration the importance of Whitehall and Parliament Street, and the need for a thoroughly efficient and, as far as possible, uniform system of lighting in the thoroughfare; and in this connection we would point out that the existing lamps are gas-lamps, and that Parliament Square, Bridge Street, and Victoria Street, and the parishes of St. Margaret and St. John generally, are also lighted by means of gas-lamps. Further, the Council have adopted high-pressure gas-lamps for the lighting of the important thoroughfares of Kingsway and Aldwych.

After a careful consideration of the tenders and of all the circumstances, we are of opinion that it is desirable that the streets in question should be lighted with high-pressure gas-lamps. It is, however,

advisable that, as far as possible, the contracts under which the parishes of St. Margaret and St. John are lighted should be coterminous, so that, if the Council should, at the expiration of the contracts, desire to reconsider the method of lighting in the district in question, they would be able to deal with the district as far as possible as a whole.

We are of opinion, and accordingly recommend—"That the Gas Company's tender should be accepted, subject only to the following variations of the City Engineer's specification and the general conditions of the contract.

General Conditions.

Clause 12.—Time for completion of installation to be altered from one month to three months.

Clause 14.—The Council's wages and hours clause to be omitted. (The Council have deleted this clause from previous contracts with the Company.)

Specification.

Clause 5 (*Tests of Lighting*).—Clause to be adhered to; it being understood that tests will not be taken until one hour after the schedule time of commencement of lighting.

Clause 7.—Twelve o'clock noon to be substituted for twelve o'clock midnight as time of completion of contract day.

Clause 10 (*Compensation to Third Parties for Accidents*).—Clause to stand. The Company to be allowed to place their gas-compressor plant in the disused underground lavatory in Whitehall, and to pay a rent of £1 per annum for the accommodation.

Clause 12.—The contract to terminate upon the same date as the contract with the Gaslight and Coke Company for the lighting and maintenance of incandescent gas-lamps in the parishes of St. Margaret and St. John and the parish of St. Martin-in-the-Fields.

Mr. SPENCER-SMITH moved the adoption of the report and recommendation. He said the Electric Supply Corporation had written to the effect that though nominally their illuminating power was 900 candles, in reality it was 1200, and that on ten years' lighting the cost per lamp would be £17 15s. 9d. on the first tender, and £15 3s. 6d. on the second tender. But he pointed out that even on this the first tender would be £2 14s. 9d. per standard, and on the second tender 2s. 6d. per standard, more than gas. In addition, the Council would have to pay £42 10s. for the installation of every standard. He thought the Council could not do better than accept the tender of the Gas Company, and at the end of four years, when some of the contracts expired, they would be in a better position to decide between the claims of the two rival illuminants.

Mr. HEYWOOD moved that the report be referred back for further consideration. Only on the previous day, he said, the City Engineer had issued particulars from which it appeared that the Committee had deliberately gone against his expressed opinion. He (the speaker) was against both the Companies; but, from a Labour standpoint, he would vote against the recommendation because the Gas Company objected to the Trade Union clause. He could not see why a difference should be made between the Gas Company and any other tenderer. With regard to another alteration proposed by the Company, it was not, in his opinion, fair that so many hours' notice should be given them before testing the light. However, apart from these matters altogether, he could honestly say that he had not had time to study the Engineer's report, and he therefore believed it was to the interest of the Council that a decision should not be arrived at that day. He understood that the recommendation was carried at the meeting of the Sub-Committee by the casting vote of the Chairman.

Alderman EVERITT, in seconding the reference back, said he favoured the acceptance of the Gas Company's tender until a comprehensive lighting scheme for the whole of the district could be formulated. He also strongly objected to the Trade Union clause being struck out. He admitted that gas was very good; but, in his opinion, it was not fair to the Electric Supply Corporation to allow the Gas Company to strike out the clause.

Mr. PENFOLD suggested that the contract should be from year to year, as experiments in both systems of illumination—gas and electricity—were being carried on. He, too, objected to the Gas Company being allowed to strike out the Trade Union clause.

Mr. GATTI said the electric light tender was the lowest; and it was not fair, when tenders were called for five years, to figure out the cost for ten years. This estimate of ten years was based on the assumption that the price of electricity would remain the same; but there was no likelihood of the cost of current being as high five years hence as it was now. Great advances had been made during the past year or two in the electrical world; and the new arc lamps had reduced the cost of electricity by two-fifths. It was only a question of time when there would be further reductions.

Mr. WILMSHURST, referring to the Trade Union clause, said the Gas Company paid their men a commencing wage of 23s. per week, and granted them sick benefits, holidays, and pensions. He was a member of two Trade Unions, and had no hesitation in saying that the conditions under which men worked for the Company were better than those of Trade Unions. He would like to know if the Electric Supply Corporation did as much for their men as the Gas Company did. The cry about Trade Unionism had, in his opinion, only been raised by a party to suit their own purposes. He would vote for the reference back on condition that inquiries were made as to the members of the Council who held electric light and gas shares.

Mr. OWEN EVANS said the Gas Company paid more wages for the time their men were employed, and treated the men better in every respect, than men were treated under Trade Union conditions. This was proved when the matter was brought up before on a contract entered into with the Company. It was further proved that the spirit of the clause in question was satisfied by the Company. He had heard practically no objection to the contract going to the Gas Company except on the Trade Union clause.

Mr. CLEAVE drew attention to the fact that the Electric Supply Corporation had offered free current for 18 months. This was extremely liberal of them; but it might prove in the long run an expensive gift to the Council. It required no argument to prove that the tender of the Gas Company was the better one, and ought to be accepted.

On a show of hands, the proposal to refer the report back to the Committee was carried.

NOTTINGHAM GAS TROUBLE.

Unexpected Development.

Under the above heading, the "Nottingham Express" on Saturday gave particular prominence to the following account of what is reported to have occurred at the previous day's meeting of the Corporation Gas Committee.

The difficulties which have so long beset the Nottingham gas undertaking reached an unexpected and significant climax yesterday, when Councillor E. Harlow resigned his position as Chairman of the Gas Committee.

The report of Sir George Livesey, the noted gas expert, whose advice the City Council decided to take when the "disclosures" were made some months ago, was received by Mr. Harlow at the beginning of the week, and copies were supplied to the members of the Committee on Thursday. Yesterday they met to consider the report and the circumstances with which it dealt; and the discussion was both protracted and heated.

The opinions expressed by Sir George Livesey were adverse to the policy which has been recently pursued in connection with the department; and in view of the nature of the report and of other matters, the Chairman of the Committee strongly advocated taking a very firm stand; and moved a resolution to that effect. An amendment was moved that the matter should be delayed; and on being put to the vote, this amendment was carried.

The Chairman thereupon intimated that he could not identify himself with a policy of further delay, and announced that, under the circumstances, he would tender his resignation as a member and Chairman of the Committee. Mr. Harlow stated that he had most carefully thought out the whole question, and felt that this was the only course he could adopt. Other members of the Committee expressed themselves strongly in sympathy with the Chairman; and while not there and then resigning their positions, it is not at all unlikely that they may take this course. As a matter of fact, it is stated that two have already done so.

Readers will not need to be reminded that for some considerable time past the affairs of the Gas Committee have been from time to time very adversely criticized; and some two or three years ago Sir George Livesey was called in to prepare a report on the undertaking. It will also be remembered that Mr. Harlow's predecessor (Alderman J. P. Ford, J.P.), resigned his position as Chairman of the Committee. It has been felt that under Mr. Harlow's chairmanship such improvements were gradually being effected as would in time dissipate the hostile criticisms which had been levelled at the department. These were almost exclusively concerned with the quality of the gas. The matter was discussed at a recent meeting of the City Council, when it was decided to defer a full debate until the report of Sir George Livesey had been received. As already stated, this document has now come to hand; and it has resulted in the present crisis.

Sir George was called in to report on the whole gas undertaking; and the report, which is a very lengthy document, discusses very fully, we understand, what he considers to be the cause of the difficulty. He points out that there have been exceptional circumstances; but he expresses the opinion that practically the whole trouble has been got over now.

It is expected that the report will be laid before the City Council when they meet on Monday week; and the course they will take in the matter will be anticipated with the liveliest interest.

The "Nottingham Guardian," on the same subject, says:

It will be remembered that some months ago, in consequence of the numerous complaints as to the Nottingham gas supply, a decision was arrived at to call in the eminent expert, Sir George Livesey, to report upon the undertaking. The report has been anxiously awaited; and a statement on the whole subject which Mr. E. Harlow, the Chairman of the Committee, had promised to make to the City Council has had to be deferred because of the delay in its arrival.

We now learn that the document came to hand at the beginning of this week; and a special meeting of the Gas Committee was summoned to be held yesterday to consider it.

The contents of the report are regarded as being of a private character; but we believe that the general methods of the Committee in their conduct of the gas undertaking are to some extent criticized. At the same time Sir George Livesey does not hold that the Gas Engineer, Mr. J. H. Brown, is responsible.

Considerable difference of opinion as to the action they should take was manifested among the members of the Committee; and the outcome was that Mr. Harlow tendered his resignation as Chairman.

Hebden Bridge Gas Board.—The accounts for the past year of the Hebden Bridge and Mytholmroyd Gas Board show a gross profit on revenue account of £4306; and after deducting £3659 for dividend on the 3 per cent. redeemable stock, interest on mortgage loans, and the amount of instalments to the redemption sinking fund, there is left a net profit of £646.

Meltham Gas Supply.—At a meeting of Meltham (Huddersfield) Urban District Council, on Monday last week, it was decided to reduce the price of gas for lighting purposes from 3s. 3d. to 3s. 1d. per 1000 cubic feet, and for trade purposes from 2s. 6d. to 2s. 5d. A discount of 7½ per cent. will be allowed on accounts of £25 and upwards for lighting purposes if paid within fourteen days from the date of the demand note. The net profit of the undertaking in the past year amounted to £571 2s. 9d.—an increase of 11 per cent. on the previous year. During the twelve months, 15,799,000 cubic feet of gas were manufactured, or 1,533,000 cubic feet more than in the year 1904-5. There were 1907 tons of coal carbonized, yielding 8340 cubic feet of gas per ton, against 8651 cubic feet per ton before.

AFTER FIFTY-FIVE YEARS' SERVICE.

Presentation to Mr. John Surman.

There are few occasions on which pleasure and regret are more strongly amalgamated than when the time comes for the severance of a long and honourable friendship, and when those who are staying behind are loading on the departing one their good wishes and material tokens of regard. There was that dual feeling in the dining-hall at the South Metropolitan Gas Company's offices last Wednesday afternoon, when Mr. John Surman, late Chief Storekeeper to the Company, and —what would it be?—say, nearly sixty years ago, one of the playmates of Sir George Livesey, returned after nearly three months' absence, to the offices which he knows so well in the Old Kent Road to formally say "Adieu" to his late brother officers, and to receive from them those durable mementoes of esteem and comradeship which it is always as pleasant to give as it is to receive. It was at the beginning of March that Mr. Surman officially retired; and on March 6, there appeared in the "JOURNAL" an account of his long connection with the South Metropolitan Gas Company, covering a period of 55 years—commencing as office boy to the late Mr. Thomas Livesey and ending in the responsible post of Chief Storekeeper, for with the growth of the concern it had indeed become a responsible position.

Nothing could have been more fitting than to have on this particular occasion Sir George in the chair, with his almost life-long friend "John" on the right-hand side. All the Company's official ranks were represented there—those of high and low position on the staff, those who have grown grey in the service, and those who are in their novitiate stage, with the whole length of manhood's ladder in front of them.

Addressing those before him, Sir George's first words were as to the appropriateness of this recognition of good feeling and appreciation of good service. He then read the beautifully illuminated, gilt-framed address to Mr. Surman. It was as follows:—

TO JOHN SURMAN, ESQ.,

CHIEF STOREKEEPER, SOUTH METROPOLITAN GAS COMPANY.

Your Brother Officers, at the close of your official career, desire to express to you their sincere admiration for the high qualities which have distinguished your long life in the service of the Company, covering as it has a period of 55 years.

Beginning at the foot of the ladder, you rose by your ability and zeal to the control of one of the most important departments in the Company's service (requiring special knowledge and power of organization), and closely associated with the great development of the business during recent years.

You proved yourself fully equal to the constantly growing demands upon your powers; and now at the close of your official life, you have the satisfaction of knowing that you surmounted every difficulty, and earned the respect and affection of your colleagues, and of all grades of the Company's servants, together with the esteem of the Chairman and Directors.

You take with you the most cordial good wishes of all with whom you have been associated, and the earnest hope that you may enjoy for many years in health and happiness your well-earned retirement.

In asking you to accept this address, together with a watch and purse of money, which they present to you with very real pleasure, your Brother Officers hope that these proofs of their regard may from time to time serve to recall to your mind the colleagues and friends, who now part from you officially with deep feelings of regret.

Signed on behalf of the subscribers,

March, 1906. FRANK BUSH, *Secretary to the Company.*

In proceeding with his remarks, the Chairman contrasted the present assembly with the conditions that existed when Mr. Surman first joined the Company, when, instead of the Company's officers being represented by a large room full, they could all have been accommodated on the front row of chairs, with perhaps three or four added. Coming to the purpose for which they were met, Sir George said that both his friend and himself had had a long life in connection with the Company, and to feel that it was drawing to a close—though it had been a happy life on the whole, there had been trials for both of them—was the warning that life itself was also nearing its end, and this made one feel a little sad. But there was also the other side; there was the pleasant side. They had had their innings. So far as his friend was concerned, he hoped it had been a satisfactory innings; so far as his employers were concerned, he could say it had been very satisfactory. He (Sir George) was an officer of the Company in a very subordinate position when John Surman first entered the service; and he had seen his career all through. And he could say there had never been an occasion on which fault could be found with him, right from the time when he became office boy to his father (Mr. Thomas Livesey). Then Sir George got on to the track of reminiscences, and the exploits of his old playmate. The child was father to the man. John Surman was a boy that his playmates and others could depend upon; and he had been the same all his life. That was an essential point with any man or boy, or anyone else, to be dependable—one whose word was his bond, one who would stand by his friends in all circumstances, never betray them or never desert them, and always ready to give them a helping hand. If his friend had not been such a man, he would not have been there to-day to receive the gifts and good wishes of his colleagues. Mr. Surman attained his present position through his own inherent qualities; and he (Sir George) was proud and pleased indeed to be in the position in which the officers had placed him that day in asking him to make this presentation. He did so with the greatest pleasure, joining heartily and thoroughly in the sentiments contained in the address. He could only add that he sincerely hoped Mr. Surman would live many years to enjoy his retirement, and that he would still lead a useful life; for he (Sir George) did not wish him the misery of having nothing to do, or nothing to occupy him. He did not think it would be possible for Mr. Surman in his retirement to be anything different from what he had been in the past—the friend of all he could help and assist. In conclusion, he commended this example of faithful service to the youngest among those present.

Then the Chairman handed to Mr. Surman the framed address, a choice semi-hunter gold watch, and a handsome silver-mounted pocket book containing some bank notes.

Succeeding came several other speeches. Mr. Frank Bush thanked the Chairman for coming to make this presentation to his (Sir George's) life-long friend. It was with unfeigned regret that they parted from Mr. Surman. The place would not seem the same without his familiar face. But he left behind him a record for honest and fair dealing which they might all strive to emulate; and he carried with him the affection and regard of all his brother officers. Mr. Carpenter next spoke; and his remarks showed that it was some 25 years ago since he came into contact with Mr. Surman in connection with the Stores Department. He was always honest, kindly, and fair-minded; and these three qualities had had a great deal to do with his success. Mr. Richardson and Mr. George Drumgold—the former of whom had worked with Mr. Surman nearly 40 years, and the latter 32 years—next made happy little speeches; and following, Mr. H. C. Sims confessed (though one might by Mr. Sims's appearance be pardoned for questioning it) to an acquaintance extending over 34 years. Mr. Butcher, one of the Employee Directors, also spoke of his 25 years' association with Mr. Surman. There is no need to indicate the points of the speeches. They all bore honest testimony to the finest feelings of esteem and to the depth of the sincerity with which all desired that their veteran fellow worker should live long to enjoy his well-earned repose from the strain of daily duty. His present excellent health gives promise of fulfilment.

Sir George, in bringing the speech-making to a close, could say no more than "well done, good and faithful servant," and give expression to the hope that, when the supreme moment came, their friend and all present might hear the welcome words: "Well done, good and faithful servant, enter thou into the joy of thy Lord."

Mr. Surman rose, and was greeted most enthusiastically. He could not give adequate expression to his feelings; but this conveys what he desired to say to Sir George and his numerous friends: The time has passed when I took my official departure; and now the less momentous, but to me equally important, one has arrived, to bid you socially "Adieu." Needless to say, the occasion, though somewhat a sad one, in thus bidding so many friends and colleagues of almost a life-time farewell, is yet to me a proud moment, for both by your kind words and handsome presents you bid me depart in peace. Certainly, I can truly say no one ever retired with feelings of greater cordiality towards, and regards for, his friends and colleagues than I bear to you all. Casting back my thoughts over the more than fifty years' service, I feel I have much—very much—to be thankful for. My life has indeed in the service of the Company been cast in pleasant places. No company or employer ever treated an employee more kindly than it has always treated me, and, I might even take it on myself to say, its people generally. I may emphatically say that were I to live my life over again I could desire no better service than that of the South Metropolitan Gas Company. Having thus borne witness to the Company, I may now do so to you all. Particularly to you, Sir George, next to your father, I feel I owe as much as one man can to another; and I cannot say more. To my colleagues generally, whatever kindness and good fellowship dictated has always, I trust, been reciprocated between us. May that spirit prevail, and continue among you in the future as it has in the past. Now as to these presents, needless to say I eagerly accept them, and shall prize them for all time; and as by your kindness such a handsome sum is at my disposal, I take the opportunity of making a substantial subscription to the Widows' and Orphans' Fund. I warmly thank you all for enabling me to do this. Now, Sir George and gentlemen, "Farewell." May you all part from life's active work with the same proud and happy feelings that you enable me to do to-day.

The proceedings ended with a vote of thanks to Sir George, proposed by Mr. Coggin and seconded by Mr. Trill.

SOUTH AFRICAN LIGHTING ASSOCIATION, LIMITED.

The Ordinary General Meeting of the Association was held last Wednesday, at the London Offices, No. 90, Cannon Street, E.C.—Mr. D. FORD GODDARD, M.P., in the chair.

The SECRETARY (Mr. William Cash, F.C.A) read the notice convening the meeting; and the Directors' report and accounts were taken as read.

The CHAIRMAN, in moving their adoption, said he should first like to express the regret of the Board that Mr. Corbet Woodall was not with them that day. He had fully intended to be present, even as late as the previous day. He was unwell; and they were sorry that this should be the cause of his absence. Turning to the report, he said it was of a very ordinary kind—he meant by this, ordinary for their Company. It possessed the same features that so many of their reports had. It showed a certain amount of progress. In some ways, the position of affairs in Port Elizabeth had, so far as their accounts were concerned, improved; but their officers there, he was sorry to say, had to report a very grave depression of trade on almost all sides. It had not, however, seriously affected the sale of gas; and indeed the Directors said in their report that the sale showed "a satisfactory increase." Regarding the acknowledgment in the first paragraph of the report of how much this was due to the exertions of their officers, he thought the shareholders would agree with the Directors that this was worthy of being recorded, because they were constantly confronted with difficulties in this way. The shareholders would probably know that the Municipality of Port Elizabeth had started on their own account an electric lighting installation; and in the most recent local newspapers to hand there had been reports of the opening ceremony. Shareholders were always apt to be somewhat alarmed when these kind of reports were received;

and, of course, the appearance of any competition meant more or less anxiety to those who had the control of an undertaking like their own. Still the Directors believed that the progressive policy they had shown by reducing the price of gas on every possible occasion, and the energy of their officials in looking after customers and canvassing from house to house, with the constant increase of cooking by gas, would maintain the position of the Company, notwithstanding the competition of the electric light. The sale of gas had increased during the year, though not to a very large extent, but still enough to be on the right side, and show an improvement. As he believed he foretold at the last meeting would be the case, the number of consumers was growing. This was the best proof they could have of the extending use of gas. During the year they had added something like 358 consumers to their roll in Port Elizabeth; and, as their Manager pointed out, this meant roughly one new consumer for every day in the year. If they could progress in this ratio, they would be quite satisfied that they could maintain their position, notwithstanding the growing competition. The leakage account, which one always had to keep an eye upon, showed no great change—it was about 5 per cent.; and the increase in the sale of gas was also about 5 per cent. During the year, the cost of coal had been a trifle—something like 2s. 8d. per ton—less than in the previous year. The consumers, he thought, evinced their appreciation of the article the Company supplied by the amount they took. This brought him to a very interesting figure. The ordinary English average consumption per consumer was about 33,000 cubic feet per annum; and in their own case it was 33,600 cubic feet. Considering that in South Africa they had none of the circumstances which so often obtained in England, such as sudden cold, fogs, and things of that sort, which sent up the consumption of gas, he thought their figures compared exceedingly favourably with the average in England. The Company had given considerable concessions to those who used gas for cooking purposes; and by this means they were increasing their business. They were also always opening up fresh districts for gas consumption; and they had laid a large quantity of new mains during the year—in fact, nearly the whole of the capital expenditure had been due to the extension of the mains in various directions. In regard to manufacturing costs, they were also in a progressive way. He believed the cost had been reduced per 1000 cubic feet into the holder since last year by something like 3d. per 1000 cubic feet, which was very satisfactory. There was nothing much to report in regard to labour. They were using now a certain proportion of carburetted water gas; and it was not only satisfactory so far as it was a new outlet for coke, but it was satisfactory because it eased the anxieties of their Manager. In regard to Grahamstown, there was a slight increase of consumers. But things were rather flat there at the present time; and they had only added 28 consumers in the course of the year. The works called for no remark. Turning to the capital account, the shareholders would see it had been increased. The expenditure, as he had said before, was largely on mains. The amount spent in this direction had been £4385; and for purifiers £680. This expenditure was at Port Elizabeth; and in Grahamstown they had spent about £266 for mains. The outlay of capital for mains was a very good sign, because the further they could carry them within reasonable distance, it implied they had customers there who required gas. It had been usual on these occasions for Mr. Corbet Woodall to make a statement showing the general growth of the business of the Association; and he regretted he was not present to make the statement on this occasion. He had, however, sent him some figures about which he (the Chairman) would like to say a few words. They constituted a comparison between the position ten years ago and now. During the past ten years, the capital account had increased by more than 84 per cent.; while the sale of gas during the same period had increased by 165 per cent. Of course, the result of this was that their capital and gas consumption bore a more favourable relation to each other than they did before. This enabled the Company to sell gas at a cheaper rate, because they could be satisfied with less profit per 1000 cubic feet; and they were working under very much better conditions. The average price of gas at Port Elizabeth ten years ago was 10s. 3d. per 1000 cubic feet; while they had now been able to reduce the average to 7s. 10d., which he thought exhibited very satisfactory progress. Then, of course, during the whole of this period, they had added to the reserve funds. Some of these had been in the nature of coal reserves; some in the nature of premiums, which they were using in the business, but on which they were paying no dividend, and which had therefore saved the Directors the necessity of raising fresh capital, and paying dividends thereon. There was one paragraph in the report to which he must allude, and with very deep sorrow. It was the one which recorded the death of their old colleague, Mr. James Mansergh. He became a Director of the undertaking at the beginning; and he had been a very helpful colleague, and a true gentleman in everything connected with the Company, as he had also been in everything with which he had been associated. They all very much regretted his death. The Directors felt it was very difficult to really replace the services of a man like Mr. Mansergh. But they had to face the difficulty; and the Board had chosen Mr. James Macalister. This gentleman had had a long and extensive connection with South African trade, had resided in the country, and therefore knew the circumstances under which business was conducted there. He was familiar, in fact, with all the different trading concerns in South Africa. The Board believed that Mr. Macalister's election would be a decided advantage to the undertaking, because, while the Company had most efficient officers in South Africa, they had no Local Committee; and they had with some difficulty to guide the concern from London. Therefore, to have a gentleman familiar with the customs and the people of South Africa, would be very beneficial to them; and the Board were glad that Mr. Macalister saw his way to joining the Board, and becoming a Director.

Mr. HENRY WOODALL, in seconding the motion, said there was one little item he should like to add to the Chairman's remarks. It was as to the superlatively happy condition in which the Company were placed in regard to the smallness of their capital expenditure. If the shareholders looked at the accounts, they would see that the share capital raised was £80,000, and there were debentures to the amount of £20,000—making £100,000 in all. If they looked at the reserves, it would be found that they had something like £30,000 in one form or another. Deducting the £30,000 from the £100,000, they had £70,000 left, which worked out to a figure per million cubic feet of gas sold per annum that was considerably less than in many gas concerns in Great Britain. In foreign undertakings, the capital expenditure was generally about twice that of British concerns; and therefore it would be seen how very favourably circumstanced they were. He thought this was the most hopeful feature they had in connection with this concern.

Mr. JAMES CLOUDESLEY, Mr. CHARLES WEBB, and Mr. SAMUEL WHILE put various questions to the Chairman, the tenour of which will be gathered from his replies.

The CHAIRMAN, answering the inquiries, said the Company were still doing the public lighting; and at the moment, the Directors did not know how far the Corporation would be transferring the public lighting to their own electricity undertaking. With regard to residual products, the coke business had been about as usual. The tar business, however, had been on the increase—in fact, there had been such a demand that it was more than they could supply; and they had had to ship tar from England to supply the needs of the locality. As to ammonia, that had been a lost product. They could not get the requisite sulphuric acid, as there had been some difficulties with regard to its transit. But they were now in the very process of sending out a plant to realize the ammonia; and therefore they hoped at the next meeting to report considerable improvement in the value received from their products. As to coal, he had already said there had been a trifling improvement. The shareholders would realize how very difficult it was for the Directors to regulate the stocks of coal in South Africa. Only quite recently, they had been put in some difficulty. They found it advantageous to take their coal, for most part, from Australia. It was a most suitable coal; they could get better shipments of it than of English coal; and their Manager preferred it to English coal, in respect of its gas-making properties. They arranged the shipments—1800 to 2000 tons at a time—so as to arrive at regular intervals. One ship unfortunately was lost lately; and this threw the whole of their arrangements into confusion. They did not like to keep large stocks, because of the deterioration of the coal. When there was an accident of this kind, they had to resort to sending coal from England to fill the gap. This caused the price to rise; but they tried to adjust the deliveries as far as possible. The make per ton of Australian coal was about 10,000 cubic feet per ton. Considering the price, the yield of gas from the Australian coal was rather better than from English.

The motion was unanimously carried.

Proposed by the CHAIRMAN, and seconded by Mr. MACALISTER, a dividend of 6 per cent. was declared, free of income-tax, making 10 per cent. for the year.

On the motion of Mr. A. L. DON, seconded by Mr. G. CRISPE WHITELEY, Mr. D. Ford Goddard, who was the retiring Director, was unanimously re elected.

The Auditor (Mr. P. D. Griffiths, F.C.A.) was re-appointed, on the proposition of Mr. HOLLAND, seconded by Mr. J. L. CLOUDSLEY.

The CHAIRMAN spoke in the highest terms of praise of the admirable and loyal manner in which the Company were served by their Manager and his staff in South Africa, and moved a vote of thanks to them. He mentioned that the Board were just sending out an Assistant-Manager (Mr. R. E. Taylor); and, as soon as he arrived, their Manager would come home for a brief holiday, because it was very necessary for him to come in contact with new developments in manufacture and use.

Mr. SAMUEL WHILE seconded the motion; and it was heartily carried.

A similar compliment was cordially paid to the Directors, on the motion of Mr. JAMES CLOUDESLEY, seconded by Mr. WEBB.

The CHAIRMAN'S reply concluded the proceedings.

CAPE TOWN AND DISTRICT GASLIGHT COMPANY.

Trade Depression and Coke Sales.

The Ordinary General Meeting of the Company was held last Thursday at the London Offices, New Broad Street House, E.C.—Mr. J. E. LILLEY in the chair.

The SECRETARY (Mr. H. Yuill) read the notice convening the meeting; and the Directors' report and the accounts were taken as read.

The CHAIRMAN, in moving the adoption of the report and accounts, said the shareholders would notice that, during the past year, the make of gas had been rather smaller than it was during 1904, although it was larger than during 1903, or any previous year. The Directors had become so accustomed to coming before the shareholders and announcing that they had done a largely increased business during the previous year, that it seemed somewhat unusual for him to have to remark that the business for the past year had been rather smaller. But there were very special reasons why it should have been smaller. When he addressed the shareholders last year, he warned them that they could not expect further immediate increases in their business; and the reason he did so was because it was clear to all who had any connection whatever with South Africa, and observed the state of affairs there, and especially to those who had experience of financial dealings with South Africa, and more particularly with Cape Town, that very serious depression existed there. But he could not then foresee, nor did he think anyone could have then foreseen, how acutely this depression would increase, and how severely it would affect the Company as well as other people. It had been a depression of the most serious character. When he spoke to the shareholders last year, he told them then that the business of the country, and of Cape Town more particularly, was not in its normal condition; that the docks were not doing nearly so much business as they had then recently been doing; and that the shipping had fallen off immensely. As Cape Town was an important shipping port, this, of course, interfered very largely with the bulk of its business. He also at the same time reported that many businesses were not earning their ordinary dividends; and many of

the houses in which gas had been consumed were empty. But he did not think this condition of affairs could have been accentuated to the extent that it had been during the past year. The banks in Cape Town had had to reduce their dividends; many old-established and large undertakings had not been able to earn any dividend whatever on their capital; and the docks (which a few years ago were so crowded, with ships desiring to enter them several weeks before they could do so) had been comparatively empty, and the question of making enormous enlargements to them which existed only two or three years since had, he was sorry to say, dropped into abeyance entirely through the non-necessity for such enlargement. This condition of things, of course, affected the Gas Company, as well as it had done other people; but the worst way in which it affected the Company was in destroying the trades on which they relied as outlets for their residuals. In many cases, it had done this entirely. Some of their old customers, who had taken their bye-products for years, had, he greatly regretted, been wiped entirely out of existence, because they could not continue to carry on their business. The Company in this respect had been more affected by their customers for coke and coke breeze. They had regular customers for coke breeze who contracted to take the whole of their supply, and who had bought it for many years at good prices. He was sorry these customers had gone entirely out of existence. The coke breeze was used extensively for brick-making; and they formerly got the large price of 11d. per bushel—equal to 2s. 9d. per cwt.—which was a most important item for the Company. One of the largest consumers of breeze was a large brick-making Company—a Company which was managed by some of the best business men in Cape Town, men of high standing, and men who were disposed to put their capital where they could see a good return for it. For many years they carried on this undertaking most successfully; and yet, in the depression the demand for this firm's products ceased entirely. They were, in consequence, unable to continue to purchase the Company's; and worse than that, they went out of existence owing the Company a considerable sum of money. The shareholders would understand as long as the Company continued to make gas, they must also make residuals; and it became a serious matter indeed if they could not dispose of their coke as they made it. Soon after the failure of the Company's best coke customers, they found the stock increasing enormously. At one time it got up to 200,000 bushels, or equal to over 3000 tons. Being a very bulky article, it cost the Company very heavy sums indeed for handling, as well as requiring a great deal of room for storage. This gave the Board serious anxiety for some time. But fortunately they had installed a water-gas plant; and they gradually brought it into use—at first, only to a very small extent. But finding it reliable, and the product satisfactory, they gradually increased the extent to which they used it. This helped them in two ways—it not only prevented their having to make so much coke, but it helped them to a more profitable sale of that made in the ordinary manufacture. But under their then arrangements, the Company could only use the plant to a limited extent. They therefore made alterations and arrangements which enabled them to bring the plant into use to a much larger extent; and he was pleased to tell the shareholders that, from this cause and also through their officials having sought in every direction, both by advertisement and by correspondence, for new customers, they had at last succeeded in balancing their manufacture of coke, and, indeed, he was pleased to inform the shareholders that they had started reducing their heavy stock. It had relieved them from very great anxiety; but they had been compelled to accept much lower prices than they had ever received for this commodity before. From the sales of coke alone last year they derived £8000 less profit than they did the previous year. It was a position that had to be faced; but there was no help for it but to reduce the price. Then in the beginning of last year, a serious explosion occurred in Cape Town. Fortunately it did not injure their works; and although they had fears that it had injured their mains, yet on the close examination which had to be made, they were pleased to find the mains uninjured, and in thoroughly good condition. This, however, cost the Company large sums in excavating the roads and stripping the pipes to examine them for leakage, and necessarily added much to their expenses for repairs and maintenance. It was an item they might very well have charged to contingency account; but the Directors thought at that time they would rather let the charge go to revenue. They did so; and therefore it had been paid for out of the profits of the year. Then they had another very serious matter to battle with. Many insolvencies caused the Company to suffer badly in the shape of bad debts; and, on the advice of their Auditors (who recommended the Directors to reserve a sum which should cover every debt due to the Company about which there was any doubt whatever), they had reserved the large sum of £3850. He did not suppose a gas company had ever been known to reserve such a large sum as this for bad and doubtful debts. The Directors hoped the whole of it would not be required; but they had thought it fit, and only fair, to put this before the shareholders, and only fair to their future trading to make a reserve for this particular purpose. He feared a large portion of it would be required, because some of their oldest customers who had dealt with the Company over many years for residuals, had ceased to carry on business, and their estates were at present being wound up. It would therefore be seen that they had three most serious items in their accounts. Taking into consideration the item of repairs and maintenance, they spent last year above £2000 more than in 1904. But it was an abnormally large year. Taking into consideration, too, the loss on coke and the bad debts, they made altogether between £13,000 and £14,000 reduction of their profits. Looking at these things, he thought it would be regarded as somewhat satisfactory that they had been able to work as profitably as they had done. The Directors believed they had seen the worst of it; but he might say that the Municipality of Cape Town, in a portion of the Company's district—and the portion in which the Company had been doing business longer than almost in any other—were now competing against the Company with the electric light. But the Corporation acknowledged they were supplying at cost price; and the flat rate at which they were supplying for power purposes was, as their statement showed, very considerably below cost price. Nevertheless, he was pleased to tell the shareholders that, during March and April of this year, the Company had started on their old course again, and had obtained increases instead of decreases of consumers; and there was indication that this increase was going on a little more strongly, seeing that their Manager had cabled for 100 more meters to be sent to him immediately. As to the Board's estimates for the coming year, they were not relying on increased consumption, but on the better position they were in, through the additions to, and the alterations in, their plant, to make very large savings indeed. For some time past, and week by week, their wages sheets had shown, entirely through the alterations to their arrangements of plant, most gratifying reductions—reductions which, if continued through the year, would amount not to hundreds but to thousands of pounds. Then they did not expect to again expend such an abnormally large sum on repairs and maintenance; and with regard to bad debts, the Directors had great confidence that they would be very small indeed during the current year, notwithstanding the condition of affairs that had existed in Cape Town. From these three items, the Board relied on making large savings this year, which would put them in a far different position. The Company now supplied gas to seven municipalities. Some years ago certain of these authorities would not listen to the Company, but went entirely for the electric light. They had, however, now admitted the Company. In one or two of the districts they were supplying gas for street lighting; and in all of them gas for private lighting. In Woodstock, they had orders to supply further public lighting. This was gratifying, because it showed the Company had given satisfaction in the past. The Municipality had also invited the Company to light up a new part of their district. Referring next to the capital account, he said they had spent £13,653 during the year. Out of this, a gasholder was enlarged, a new coal-store was built, about 3½ miles of new mains were laid, and they had erected five shops, with residential rooms over them, on the ground in front of their new gasholder. It was a condition of their being allowed to erect the holder in the position they did, that the Company should build shops or houses to hide the holder from view in the main road. Further shops had to be erected; but the Board intended waiting a little, if the Municipality had no objection. He was sorry to say that their Managing-Director (Mr. J. A. Kelman) had been compelled by ill-health and almost total blindness to resign his business engagements. In order to meet capital expenditure (which he thought he had shown had been invested in a productive manner), they had raised £50,000 of debentures.

Mr. R. H. SAVORY seconded the motion.

A number of questions were asked regarding details of the business. One matter of general interest that was elicited had reference to the price of gas. The Chairman stated that the price was rather high; but the Company were handicapped by the cost of labour. They had also to send their coal from England; the freight had to be added to its cost; and there was also the duty on all coal landed in South Africa. Income-tax had also been imposed on the Company in South Africa as well as here.

The motion for the adoption of the report and accounts (which included the payment of a final dividend on the ordinary shares at the rate of 10 per cent. per annum, free of income-tax) was adopted.

On the motion of Mr. SAVORY, seconded by Mr. R. A. FAIRCLOUGH, the Chairman (who was the retiring Director) was re-elected.

Proposed by Mr. J. L. CHAPMAN, and seconded by Mr. NEWTON, the Auditors (Messrs. Kemp, Sons, and Co.) were also re-appointed.

A hearty vote of thanks was passed to the Chairman and Directors on the proposition of Mr. CHAPMAN, seconded by Mr. WANCKE. Mr. Chapman remarked that he believed the Company would come out of their trials this year. He considered that times of trials such as the Company had passed through did much to produce those economies which must result in the well-being of any gas company.

The CHAIRMAN replied; and his thanks ended the proceedings.

PROGRESS OF THE HYDE GAS-WORKS.

A long account appeared lately in the "North Cheshire Herald" as to the progress of the Hyde Gas Company, who are in the happy position of being able to supply gas at a net charge of 2s. 2d. per 1000 cubic feet for ordinary purposes. It is stated that the first part of the present works was erected, and gas made, in 1856; while the second part was put up in 1888. To cope with the rapidly-increasing business, a new three-lift holder has been found necessary; and the order for this has been placed in the hands of Messrs. C. & W. Walker. At present there are two holders, having a combined capacity of 700,000 cubic feet; while the new one will hold 750,000 feet. After paying a tribute to the successful efforts of Mr. Charles Potts, who has since 1898 been Secretary and Manager of the undertaking, in developing the gas consumption, the writer of the article quotes figures to show the progress made by the Company during the last twenty years.

In the year 1885, the capital expended was £65,640; and the quantity of gas sold amounted to 83,105,000 cubic feet. In 1890, the capital expended had grown to £79,044, showing an increase of 21·9 per cent. in the previous five years; while the yearly consumption (gas sold) had reached 94,739,000 cubic feet, an increase of 13·8 per cent. Up to 1895, there had been no further increase in the capital; but the quantity of gas sold per annum had advanced to 108,761,000 cubic feet, or an increase of 14·8 per cent. In 1900, the capital expended had advanced to £88,526—the increase since 1890 being 12·1 per cent.; and the gas sold was 127,960,000 cubic feet for the year—an increase of 17·6 per cent. during the preceding five years. In 1905, the expended capital had advanced to £97,644, an increase of 10·3 per cent. in the five years; while the increase in gas sold was more remarkable than ever, the quantity having reached 152,133,000 cubic feet per annum, the percentage of increase being 19·6—the largest during the whole period covered. From 1885 to 1905, the increase in capital expended was 48·7 per cent.; and in gas sold, 83 per cent.

On Dec. 31 last, the number of ordinary consumers was 5763; and of slot-meter consumers, 1960—making a total of 7723. The total number of consumers on Dec. 31, 1885, was 4170. There was thus an increase in the twenty years of 3553, or 85·2 per cent. The number of cookers now in use is 600; of grillers, 3138; of small boilers, 364; and of gas-engines, 78. The use of gas-cookers was introduced in August, 1899; and of slot-meters, in March, 1900.

USE OF WATER GAS AND OTHER GASES IN FACTORIES.

Amended Home Office Memorandum on Carbonic Oxide Poisoning.

In the "JOURNAL" for Oct. 11, 1904 (p. 120), we reproduced a memorandum, signed by Dr. Whitelegge, the Chief Inspector of Factories, which had been issued by the Factory Department of the Home Office, on the use of water gas and other gases in industrial establishments. The document has since undergone revision, and we have received from the Department an amended print, the principal portions of which are given below.

In recent years, there has been great extension of the manufacture and use of water gas and other gases of a similar nature (Dowson gas, Mond gas, power gas, producer gas, blast-furnace gas, suction gas, &c.) for the heating of furnaces and boilers in factories, driving gas-engines, welding, soldering, and many other industrial purposes. The particular danger associated with all these gases is that of poisoning by carbonic oxide (carbon monoxide, CO), which is also a constituent of ordinary coal gas. But whereas the proportion in coal gas varies from 4 to 12 per cent., in carburetted water gas it reaches 30 per cent., and in uncarburetted water gas 50 per cent. The other gases named above usually contain from 10 to 25 per cent.

The use of these gases was the subject of an inquiry in 1899 by a Departmental Committee, who recommended in their report that the manufacture and distribution for heating and lighting purposes of any poisonous gas which does not contain a distinct and pungent smell should be prohibited, and that regulations should be made limiting the proportion of carbonic oxide. In recent Acts authorizing companies and local authorities to manufacture and supply Mond or similar gas for motive or heating purposes, it is required that (1) the gas shall be strongly scented, and that (2) either the quantity of carbonic oxide in the gas shall be limited to 14 per cent., or, when not so limited, the Secretary of State may impose such regulations as may be deemed necessary to protect against the risk of poisoning. It is made the duty of H.M. Inspectors of Factories to enforce these provisions as regards factories and workshops to which the gas is distributed.

The annual reports of the Factory Department during the seven years 1899 to 1905 contain references to at least 108 cases, including 35 deaths, of poisoning by carbonic oxide on manufacturing premises. Of these, 57 (with 18 deaths) have been reported in the last two years. This list does not include the slight cases of partial unconsciousness of which there is mention, entailing only a few hours' absence from work. These casualties were traced to several causes, among which may be mentioned: (1) Leakage from joints or taps in pipes or flues conveying gas; (2) gradual escape of gas into a small engine-room, weigh cabin, office, or the syphon-pit of the Dowson apparatus; (3) cleaning and repairing of engines and of tanks, scrubbers, or blast-furnace flues, before a sufficient time had been allowed for the gas to escape; (4) inefficient disconnection from the blast-furnace of the flue during cleaning; (5) charging cupola furnaces at raised platforms; (6) underground situation of flues, and percolation of gas through several yards of soil; (7) conveyance by the wind of gas escaping from defective reservoirs, or of waste gas allowed to blow off unburnt, through ventilators and open windows into workrooms at some distance from the gas-generating plant; (8) incomplete combustion of gas in defective gas ironing-machines; (9) ignorance of danger and of the earliest symptoms produced; (10) inodorous nature of the gas; (11) working alone; (12) lack of rescue appliances.

Carbonic oxide poisoning may occur in other ways without inhalation of the particular gases named. Thus danger of this kind may arise in laundries from the use of gas-irons, and in workrooms from defective gas-fittings (especially absence of stop-pins or other appliances indicating the cutting off of gas) and from gas-stoves, when no provision is made for the products of combustion to be carried away by a flue or chimney. The absence of a chimney in a room greatly increases the risk. Carbonic oxide is found also in lime-kilns, cement-works, and where braziers and coke-fires are used in confined spaces.

After indicating the symptoms of carbonic oxide poisoning, as given in the previous memorandum, the preventive measures, in an extended form, are reproduced as follows:—

1.—Notices should be posted up stating the deadly nature of the gas, the symptoms produced by its inhalation, and the best means of rendering aid to those who are "gassed."
2.—Persons in charge of any engine worked by the gas, or of any apparatus in which it is stored, or otherwise exposed to risk of inhaling carbonic oxide, should be free from any disease of the heart or lungs. Employers would do well to cause such persons to be examined and certified by a medical man.
3.—No person should be allowed single-handed to execute work in places where exposure to the gas is to be anticipated.
4.—No engine in which the gas is used should be in a confined space.
5.—A competent and responsible person should, at stated short intervals, inspect all valves and connections, to see that there is no escape of gas; and a signed record with the dates of such inspections should be kept.
6.—The openings giving access to any part of the gas circuit should be few, and in positions as safe as possible, and opened only in cases of real need and by responsible persons.
7.—No workman should enter, or approach when opened, the holder or other part of the gas circuit until the gas has been well flushed out by fresh air.
8.—A cylinder of compressed oxygen, fitted with a piece of rubber gas-tubing and a mouthpiece, should be kept in constant readiness. Such cylinders can be obtained fitted also with a reducing-valve.
9.—Medical aid should be summoned immediately; but in view of the importance of losing no time in commencing treatment, the workmen employed should be instructed by a medical man in the manner of administering the oxygen and of performing artificial respiration. They should be especially warned of the danger of exposing the patient to cold.

It is pointed out that respirators of the usual type designed to protect the wearer against inhalation of dust are of no avail as a protection against carbonic oxide poisoning.

The remainder of the memorandum consists of the notice drawn up by the Power Gas Corporation, Limited, in consultation with the Medical Inspector of Factories, to be posted up near the place where danger arises, and the notice framed by the Associated Portland Cement Manufacturers, Limited, both of which were given in the previous memorandum.

The Rowley Regis and Blackheath Gas Company have placed an order with Messrs. Robert Dempster and Sons, Limited, of Elland, for a steel tank 63 ft. 9 in. diameter by 20 ft. 6 in. deep, with a single-lift gasholder, prepared for telescoping.

GAS COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 634.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
590,000	10	Apl. 11	10½	Alliance & Dublin 10 p.c.	21—22	..	4 15 5
160,000	10	,,	7½	Do. 7 p.c.	14¾—15¼	..	4 16 9
200,000	5	May 11	7	Bombay, Ltd.	6⅞—7	..	5 0 0
40,000	5	,,	7	Do. New, £4 paid	4⅞—5¼	..	5 6 8
50,000	10	Mch. 9	14	Bourne-mouth Gas and Water	28½—29½	..	4 14 11
51,810	10	,,	7	Do. B 7 p.c.	16½—17½	..	4 0 0
53,200	10	,,	6	Do. Pref. 6 p.c.	15—16	..	3 15 0
380,000	Stk.	Feb. 22	12½	Brentford Consolidated	263—268	..	4 13 3
300,000	,,	,,	9⅜	Do. New	200—205	..	4 12 8
50,000	,,	,,	5	Do. 5 p.c. Pref.	123—128	..	3 16 11
206,250	,,	Dec. 14	4	Do. 4 p.c. Deb.	105—108	..	3 14 1
220,000	Stk.	Mch. 9	11½	Brighton & Hove Orig.	230—235	..	4 15 9
246,320	,,	,,	8½	Do. A. Ord. Stk.	165—170	..	4 17 1
460,000	20	Apl. 11	10	British	42—43	..	4 13 0
100,000	Stk.	Feb. 22	6	Bromley, Ord. 5 p.c.	121—124	..	4 16 9
165,700	,,	,,	4½	Do. do. 3½ p.c.	92—95	..	4 14 9
500,000	10	May 11	7	Buenos Ayres (New) Ltd.	12—12⅛	..	5 12 0
250,000	Stk.	Dec. 29	4	Do. 4 p.c. Deb.	97—99	..	4 0 10
150,000	20	Mch. 9	8½	Cagliari, Ltd.	23—25	..	6 12 0
100,000	10	Sept. 28	10	Cape Town & Dis., Ltd.	16—17	..	5 17 8
100,000	10	Apl. 26	4½	Do. 4½ p.c Pref.	9⅞—10¼	..	4 7 10
50,000	50	May 2	6	Do. 6 p.c. 1st Mort.	52—54	..	5 11 1
50,000	Stk.	Dec. 29	4½	Do. 4½ p.c. Deb. Stk.	100—102	..	4 8 3
1,443,280	Stk.	Feb. 22	5⅛	Commercial 4 p.c Stk.	113—115	..	4 10 5
560,000	,,	,,	5	Do. 3½ p.c. do.	110—112	..	4 9 3
475,000	,,	Dec. 14	3	Do. 3 p.c. Deb. Stk.	85—87	..	3 9 0
800,000	Stk.	,,	6¼	Continental Union, Ltd.	128—131	..	4 19 3
200,000	,,	,,	7	Do. 7 p c Pref.	143—148	..	4 14 7
452,070	Stk.	Feb.	5½	Derby Con. Stk.	122—124	..	4 8 9
55,000	,,	Jan.	4	Do. Deb. Stk.	105—107	..	3 14 9
486,090	10	Jan. 25	11	European, Ltd.	24—25	+½	4 8 0
354,060	10	,,	11	Do. £7 10s. paid	18—19	..	4 6 10
15,223,235	Stk.	Feb. 8	4⅛	Gas-light and Coke	4 p.c. Ord.	97—99	..	4 8 11
2,600,000	,,	,,	3½		3½ p.c. max.	87—89	..	3 18 8
3,799,735	,,	,,	4		4 p.c. Con. Pref.	107—110	..	3 12 9
4,193,975	,,	Dec. 14	3		3 p.c. Con. Deb.	86—88	..	3 8 2
258,740	Stk.	Mch. 9	5	Hastings & St. L. 3½ p.c.		100—105	..	4 15 3
82,500	,,	,,	6½	Do. do. 5 p.c.		121—124	..	5 4 10
70,000	10	Apl. 11	11	Hongkong & China, Ltd.		19½—20⅜	..	5 7 4
4,940,000	Stk.	May 11	8	Imperial Continental		177—179	+1	4 9 5
473,600	Stk.	Feb. 8	3½	Do. 3½ p.c. Deb. Red.		96—98	..	3 11 5
175,242	Stk.	Mch. 28	6	Lea Bridge Ord. 5 p.c.		121—126	..	4 15 3
561,000	Stk.	Feb. 22	10	Liverpool United A		235—237	..	4 4 5

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
718,100	Stk.	Feb. 22	7	Liverpool United B	163—171	..	4 1 10
306,083	,,	Dec. 29	4	L'rpool Unit'd Deb. Stk.	109—111	..	3 12 1
75,000	5	Dec. 14	5	Malta & Medn., Ltd.	4¼—4⅜	..	5 5 3
560,000	100	Apl. 2	5	Met. of Melbourne 5 p.c. Deb.	102—104	..	4 16 2
250,000	100	,,	4½	Do. 4½ p.c. Deb.	102—104	..	4 0 7
541,920	20	May 31	3½	Monte Video, Ltd.	11—12*	..	5 16 8
1,675,892	Stk.	Feb. 22	4½	Newc'tle & G'tesh'd Con.	110—112	..	4 2 7
406,625	Stk.	Dec. 29	3½	Do. 3½ p.c. Deb.	99—101	..	3 9 4
15,000	10	Mch. 9	10	North Middlesex 10 p.c.	19½—20½	..	4 17 7
52,940	10	,,	7	Do. 7 p.c.	13—14	..	5 0 0
300,000	Stk.	May 11	8	Oriental, Ltd.	147—150	..	5 6 8
600,000	5	Mch. 28	7	Ottoman, Ltd.	6—6½	..	5 7 8
398,490	5	Apl. 26	7	Primitiva Ord.	6¾—7	..	5 0 0
796,980	5	Jan. 25	5	Do. 5 p.c. Pref.	5⅝—5⅞	..	4 13 0
488,900	100	Dec. 1	4	Do. 4 p.c. Deb.	98—100	..	4 0 0
851,070	10	Apl. 26	7	River Plate Ord.	12½—13	..	5 7 8
300,000	Stk.	Dec. 29	4	Do. 4 p.c. Deb.	98—100	..	4 0 0
250,000	10	Mch. 28	8	San Paulo, Ltd.	13¾—14¼	..	5 12 3
70,000	50	Jan. 2	5	Do. 5 p.c. Deb.	50—52	..	4 16 2
135,000	Stk.	Mch. 28	10	Sheffield A	244—246	..	4 1 4
209,984	,,	,,	10	Do. B	243—245	..	4 1 8
523,498	,,	,,	10	Do. C	243—245	..	4 1 8
126,106	Stk.	Mch. 9	5½	Shrewsbury Ord. 5 p.c.	109—119	..	4 12 5
70,000	10	May 31	10	South African	15—16*	..	6 5 0
6,250,000	Stk.	Feb. 22	5⅜	South Met., 4 p.c. Ord.	127—129	..	4 5 3
1,895,445	,,	Jan. 11	3	Do. 3 p.c. Deb.	86—88	..	3 8 2
575,000	Stk.	Mch. 9	5½	S'th Suburb'n Ord. 5 p.c.	120—123	..	4 9 5
60,000	,,	,,	5	Do. 5 p.c. Pref.	125—130	..	3 16 11
112,533	,,	Jan. 11	5	Do. 5 p.c. Deb. Stk.	132—137	..	3 13 0
502,310	Stk.	May 11	5	Southampton Ord.	105—110	..	4 10 11
120,000	Stk.	Mch. 9	6¼	Tottenham and	A 5 p.c.	124—127	..	4 18 5
363,020	,,	,,	4¼		B 3½ p.c.	99—102	..	4 13 2
137,500	,,	Dec. 14	4	Edmonton 4 p.c. Deb.		105—107	..	3 14 9
182,380	10	Dec. 29	8	Tuscan, Ltd.		1¾—1¾	..	7 8 10
149,900	10	Jan. 2	5	Do. 5 p.c. Deb. Red.		99—101	..	4 19 0
30,000	Stk.	Feb. 22	7½	Wands-worth	A 5 p.c.	—	..	—
255,636	,,	,,	6¼		B 3½ p.c.	133—136	..	4 11 11
75,000	,,	,,	5⅛	and	C 3½ p.c.	110—113	..	4 16 0
£9,416	,,	Dec. 29	3	Putney 3 p.c. Deb. Stk.		83—86	+1	3 9 9
745,872	,,	Mch. 9	5⅛	West Ham 5 p.c. Ord.		107—109	..	4 14 0
185,000	,,	,,	5	Do. 5 p.c. Pref.		122—125	..	4 0 0
193,300	,,	Dec. 29	4	Do. 4 p.c. Deb. Stk.		106—109	..	3 13 5

Prices marked * are "Ex div."

BOLTON CORPORATION GAS UNDERTAKING.

The accounts of the Bolton Corporation gas undertaking for the year ending March 31 state that the revenue from the sale of 916,935,000 cubic feet of gas for public and private lighting (less discounts) was £119,433, that residuals produced £37,535, and that the total receipts were £159,157, against £160,079 the preceding year. The expenditure on the manufacture of gas was £70,845; on distribution, £8958; on rents, rates, and taxes, £8417; on management, £2012; and other expenses made up a total of £91,072, compared with £92,008 before. The balance carried to the profit and loss account is £68,085, against £68,071. After providing for annuities, interest on loans, and the sinking fund, and appropriating a sum of £20,000 in aid of the rates, the remainder, amounting to £20,621, has been placed to the reserve fund account. The total net capital expenditure on the undertaking amounted on March 31 to £636,601, or at the rate of £654 18s. 4d. per million cubic feet of gas made, £6 15s. 9d. per ton of coal carbonized, and 13s. 10d. per 1000 cubic feet of gas sold. Since the works were transferred to the Corporation in 1873, a total gross profit of £1,596,534 has been made, £388,705 has been paid in annuities, £138,762 for interest, £175,473 for dividend, £67,402 to the sinking fund, £352,114 carried to the reserve fund for renewals, &c., and £474,076 applied in aid of the local rates.

The report furnishes the following comparative statistics.

	Year 1906.		Year 1905.
Tons of coal and cannel carbonized	93,771	..	92,026
Average cost per ton delivered on the works and trimmed	9s. 10¼d.	..	10s. 2¼d.
Percentage of cannel used	0·77	..	1·87
Gas made, cubic feet	972,031,000	..	972,448,000
Gas made, cubic feet per ton carbonized	10,366	..	10,567
Gas accounted for, per ton carbonized	9,874	..	10,003
Gas unaccounted for, per cent.	4·74	..	5·33
Maximum quantity of gas supplied in 24 hours, cubic feet	5,453,000	..	6,691,000
Minimum quantity supplied	831,000	..	700,000

The report points out that the financial result of the year's working has been satisfactory, and has enabled the Committee to hand over the sum of £20,000 in aid of the district fund, and to place £20,621 to the credit of the reserve fund. The application of the incandescent system of street lighting to the public lamps, first introduced in 1899, has, it is stated, been considerably extended during the past year; and there are now in the Central, Rumworth, and Halliwell districts 2217 lamps fitted with these burners, or 63 per cent. of the total number. The improvement in the quality of the lighting in the public thoroughfares is very marked and striking. At March 31, the number of lamps in the borough was 5270; and adding 779 for Turton and Horwich districts, there was a total of 6049 lamps supplied by the department at that date.

PAST YEAR'S WORKING AT SOUTHPORT.

From the annual report of the Manager, Mr. John Bond, further particulars are available as to the operations of the Southport Gas-Works, a brief reference to which appeared in the "JOURNAL" for May 22 (p. 525). There was an increase in the sale of gas of close upon 18 million cubic feet, or equal to 3·8 per cent. as compared with the previous year's consumption. The increase in the quantity of gas sold by prepayment meter was equal to 21·96 per cent.; and that by ordinary meter, 1·08 per cent. The average consumption per prepayment meter rose from 9801 to 11,750 cubic feet. The total quantity of gas made during the year was about 4854 million cubic feet, in the manufacture of which were used: Coal, 30,992 tons; oil, 2407 tons; and coke, 3403 tons. The unaccounted-for gas was equal to 2·31 per cent. The gross profit was £27,089, or an increase of £3100; and the net profit, £13,000, or an increase of £1527. Of a total of 2379 public lamps, no less than 2168 are on the incandescent system.

A considerable amount of work has, Mr. Bond says, been done in connection with the remodelling of the retort-house. Four additional settings of retorts on the regenerative principle have been constructed in a new building, on the old water-gas site. Rather more than half the retort-house roof has been raised 13 feet, to enable them to erect eleven beds of regenerative retort-settings. The whole of the pier-walls and the main flue for these settings are now built; and the work is progressing with such satisfaction that he has no hesitation in saying that this section of the retort-house will be ready for work by the coming winter. The settings in the old retort-house, which were used for the manufacture of oil gas, have been demolished; and the house is being prepared to receive the air-compressor, exhausters, blowers, and pumps. By adopting this arrangement, and placing them all together near the boilers, there will be a very great saving in fuel used for steam purposes. Considerable alterations and repairs have also been made during the year to the coke-handling plant, which has been fitted with renewable cast-iron trough-plates and conveying chain of modern type. This work has entailed an expenditure of £422. The result, so far, of the working of the elevator and conveying chain, which is of much heavier section than the old form, warrants the expenditure.

WEST BROMWICH GAS UNDERTAKING.

The report of Mr. Thomas Hudson, the Borough Treasurer and Secretary of the Gas Committee of the West Bromwich Corporation, with the statement of accounts of the gas undertaking, for the year ending the 31st of March, have just been issued. They show that the loan indebtedness of the Gas Department is now £149,182, which is a reduction of £9278; the sinking fund having been applied in the purchase of stock for extinction to this extent. There still remains in the

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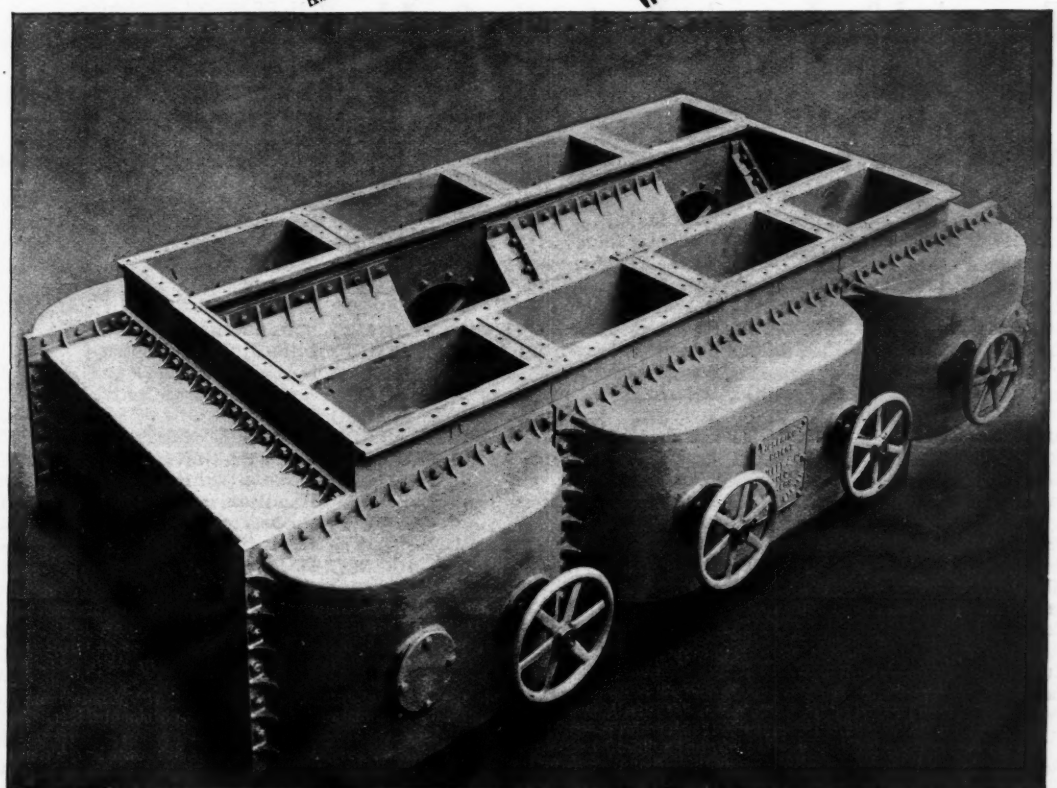

VIEW OF CENTRE-VALVE TO WORK 4 LARGE PURIFIERS, 24-INCH CONNECTIONS. N.B.—THIS IS NOT THE LARGEST WE MAKE, BUT LARGE ENOUGH TO BE INTERESTING.

sinking fund in respect of the gas-works debit a sum of £7106, which, deducted from the loan debit, gives a net indebtedness of £142,076, equivalent to 8s. 9d. per 1000 cubic feet of gas sold. The total sales of gas, including the public lighting, amount to £41,048—an increase of £400, notwithstanding that a reduction was made during the year in the price of gas for manufacturing and motive power purposes. The total quantity sold was 323,815,654 cubic feet—an increase of 6,407,944 cubic feet—spread over all classes of consumers. The quantity of gas lost through leakage and condensation was 14,231,340 cubic feet, equal to 4·15 per cent. on the make. This was slightly more than in the preceding year, owing to subsidences caused by mining. The aggregate income from residual products was £544 less than before. The quantity of coke used in heating retorts was 4299 tons, representing 23·52 per cent. of the make; and 495 tons were used in the manufacture of water gas. The total income from all sources was £56,266, against £56,579 the previous year—a decrease of £312. The total expenditure on the trading account was £42,673, compared with £43,0c9. The total manufacturing charges, including maintenance and renewal of works and plant, amounted to £30,955—a decrease of £226, though 8,874,000 cubic feet more gas were produced. Altogether, 27,528 tons of coal were carbonized, yielding 312,528,000 cubic feet of gas, or an average of 11,354 cubic feet per ton—the Engineer (Mr. Harold E. Copp) having exceeded his record of last year in this respect; and the quantity of coke used in the manufacture of water gas was 495 tons, yielding 30,432,000 cubic feet, or an average of 61,479 cubic feet per ton. The total quantity of gas made was therefore 342,970,000 cubic feet—an increase of 8,874,000 cubic feet. The gross profit on the trading account was £13,593, against £13,569 the previous year. The balance standing to the credit of the profit and loss account at the commencement of the year was £11,570, from which £741 was transferred to the credit of the extensions suspense account, thereby reducing the balance to £10,829. The net revenue account has been charged with interest on loans and corporation stock and the proper instalments towards the redemption and extinction of the debt, amounting in all to £8573; leaving a balance and surplus for the twelve months of £5020, compared with £4891 this time last year.

SELBY DISTRICT COUNCIL GAS DEPARTMENT.

The Past Year's Progress.

At the last Meeting of the Selby Urban District Council, the financial and working statements in regard to the gas undertaking for the year ended the 31st of March were presented. They furnished the following particulars: Revenue, £7428; expenditure, £4516; balance, £2912. Gas made, 42,203,200 cubic feet; gas in store, April 1, 1905, 165,900 cubic feet; together, 42,369,100 cubic feet, compared with 41,513,800 cubic feet at the close of the year 1904-5—being an increase of 855,300 cubic feet, or 2·06 per cent. Gas sold to private consumers, 30,377,700 cubic feet by ordinary and 6,167,700 cubic feet by prepayment meters, compared with 30,369,700 and 5,051,800 cubic feet respectively before. Gas accounted for, 41,105,200 cubic feet, or 97·02 per cent., against 40,384,100 cubic feet, or 97 28 per cent. Gas made per ton of coal carbonized, 11,045 cubic feet; and gas sold, 10,475 cubic feet. Total value of residuals, &c., £1705 11s. 4d., or 8s. 11·12d. per ton of coal carbonized, against £1792 11s. 6d., or 9s. 6·6d. per ton. Balance of gas-works loans, April 1, 1905, £22,586; added since, £180—total, £22,766. Deducting the amount due on March 31 last, £2006, there is left £20,760. The total sum paid for instalment and interest on loans is £2761 17s. 6d., equal to 1s. 4·55d. per 1000 feet of gas sold, or 14s. 5·47d. per ton of coal carbonized. The amount of gross profit, after paying £306 13s. 9d. towards the cost of the sulphate plant, is £2912 9s., which is equal to 12·79 per cent. interest on loans.

Some congratulatory remarks were offered by the Chairman, who observed that there was sufficient evidence to show that the gas-works were under very careful management, and that most satisfactory results had been obtained. He thought the other members of the Council would agree with him that the Engineer and Manager (Mr. T. H. Alderson) did his duty remarkably well. The Vice-Chairman endorsed these remarks, and said the result of the year's working was a very handsome profit. He was sure every credit was due to the Manager for the way he performed his work. After further congratulatory remarks had been made, the statements were adopted unanimously.

METROPOLITAN WATER BOARD.

At the last Meeting of the Board before the Whitsuntide recess, the annual estimates of the expenditure for the financial year ending the 31st of March next were submitted; but their consideration was deferred till the re-assembling of the Board on the 22nd inst. The Works and Stores Committee were authorized to incur expenditure not exceeding £2000 in respect of trial borings required to enable the Chief Engineer (Mr. W. B. Bryan, M.Inst.C.E.) to report upon the question of the construction of one of the reservoirs in the Lea Valley, at a total cost of £550,000, authorized by the East London Water-Works Act, 1900. The Committee were also empowered to incur expenditure not exceeding £6000 in respect of the provision of additional storage accommodation of 4½ million gallons at the Honor Oak reservoir. The return in regard to the supply of water during the month of April showed that the total average daily supply was 211,534,000 gallons; that the number of houses supplied was 1,045,184; that the total estimated population was 6,800,211; and that the mean supply per head per day was 31·1 gallons, against 30·3 gallons in April, 1905. The quantity of water in store at the end of the month was 7119 million gallons; the figure for the corresponding month of last year being

CARBURETTED WATER-GAS APPARATUS

Merrifield—Westcott—Pearson Patents.

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W. H. PEARSON, Junr., Deputy-Chairman
J. T. WESTCOTT, Manager.
L. L. MERRIFIELD, M.Inst.M.E., Engineer.

London Offices: 19, ABINGDON STREET, WESTMINSTER, S.W.
American Offices: TORONTO. TELEGRAPHIC ADDRESS: "CARBURETED, LONDON."

CARBURETTED WATER-GAS ENGINEERS.

The above Company have erected since 1893, or are now erecting, their Universal Type of Carburetted Water-Gas Plant at the following Gas-Works:—

	Cub. Ft. Daily.		Cub. Ft. Daily.		Cub. Ft. Daily.
Blackburn	1,250,000	Buffalo, N.Y.	2,000,000	Newcastle-on-Tyne	1,800,000
Windsor St. Works, Birmingham	2,000,000	Winnipeg, Man.	500,000	Leeds	1,800,000
Saltley Works, Birmingham	2,000,000	Colchester (Second Contract)	300,000	Malton	150,000
Colchester	300,000	York	750,000	Smethwick	500,000
Birkenhead	2,250,000	Rochester	500,000	Gravesend	300,000
Swindon (New Swindon Gas Co.)	120,000	Kingston, Ont.	300,000	Pernambuco, Brazil	125,000
Saltley, Birmingham (Second Contract)	2,000,000	Crystal Palace District	2,000,000	Duluth, (Second Contract)	300,000
Windsor St., Birmingham (Second Contract)	2,000,000	Duluth, Minn.	300,000	Leicester (Second Contract)	1,000,000
Halifax	1,000,000	Caterham	150,000	Newport (Second Contract)	250,000
Toronto	250,000	Leicester	2,000,000	Brockville	250,000
Ottawa	250,000	Enschede, Holland	150,000	Toronto (Third Contract)	750,000
Lindsay (Remodelled)	125,000	Buenos Ayres (River Plate Co.)	700,000	Montreal, Ont. (Second Con.)	1,800,000
Montreal	500,000	Burnley	1,500,000	Toronto (Fourth Contract)	1,000,000
Toronto (2nd Cont., Remodelled)	2,000,000	Kingston-on-Thames	1,750,000	Hamilton, Ont.	400,000
Belleville	250,000	Accrington	500,000	Rochester (Third Contract)	1,600,000
Ottawa (Second Contract)	250,000	Tonbridge	300,000	Leeds (Second Contract)	900,000
Brantford (Remodelled)	200,000	Stretford	500,000	Buenos Ayres (Primitiva Co.)	1,200,000
St. Catherines (Remodelled)	250,000	Oldbury	300,000	Buenos Ayres (New Co.)	1,200,000
Kingston, Pa.	125,000	Todmorden	500,000	Christchurch, N.Z.	300,000
Peterborough, Ont.	250,000	Saltley, Birmingham (Third Contract)	2,000,000	Rochdale	1,600,000
Wilkesbarre, Pa.	750,000	York (Second Contract)	750,000	St. John's, Newfoundland	250,000
St. Catherines (Second Cont.)	250,000	Rochester (Second Contract)	500,000	Brantford (Second Contract)	400,000
		Newport (Mon.)	250,000	Smethwick (Second Contract)	500,000
		Tokio, Japan	1,000,000	Pontypridd	250,000
				Montreal (Third Contract)	1,800,000

And, in addition, COAL GAS PLANTS at NELSON, B.C., CHATHAM, BERLIN, NAPANEE, OWEN SOUND, CALGARY, and WINNIPEG.

6879 million gallons. There were 1656 new supplies connected, and 9172 yards of new mains laid.

The abstract of accounts of the Board for the year ended March 31, 1905, has just been issued. It is a voluminous production, consisting of five parts, and occupying rather more than 100 foolscap pages, 9 of which consist of the index. The principal section of the accounts, so far as our readers are concerned, is that showing the revenue and expenditure. The figures in this account are for the period extending from June 24 and July 25, 1904—the dates at which the Board acquired the undertakings of the Water Companies—and therefore they do not cover a complete year's work. In that period the Board received for the supply of water a net sum of £1,928,679; for the rent of houses and lands, £8858; and from sundry sources, £53,598—making a total of £1,991,135. The expenditure amounted to £1,996,885; the following being the principal items: Distribution of water, £438,111 (including £3222 for its examination); rates and taxes, £273,369; interest and dividends, £836,145; other charges in respect of loans, £260,523 (including £6485 annuities and rent charges in respect of the purchase of the London Bridge, York Buildings, and Hampstead Water-Works); salaries, superannuations, &c., £137,341; and establishment charges (including £11,280 for printing and stationery), £27,432. The result is a deficiency of £9550, which is carried to the balance-sheet. In addition to the expenditure above specified, a sum of £3800 was set aside towards the annual contribution to the redemption fund in respect of the Board's "B" stock, due on Oct. 21, 1905.

The "Central" Counterbalance Pendant.

In the "JOURNAL" for Feb. 6 last, reference was made to the fact that Messrs. Falk, Stadelmann, and Co., Limited, had in preparation a range of three-light clusters for use in conjunction with Mr. George Helps's "Central" counterbalance pendant. An illustrated list which they have just issued dealing with this speciality, shows that the firm have also now introduced a larger form of counterbalance to permit of the employment of cluster pendants with the standard, or large size, inverted burner—instead of only the miniature size, as before. Messrs. Falk, Stadelmann, and Co. have also prepared a list of flexible-tube suspension pendants, which are particularly applicable to shop and factory lighting; an increasing demand being experienced by them for this form of fitting.

Gas Supply for Ammanford.—Ammanford, as our readers are aware, is shortly to be supplied with gas-works. A Company was formed for the purpose some time ago; and on Monday last week the work of laying the mains was commenced. The fitting of installations is also in hand; and they will be in readiness by the time the works and plant are completed. There is every indication that gas will be supplied in the coming winter. The Company's Consulting Engineer is Mr. Frank G. Vivian, of Llanelly.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

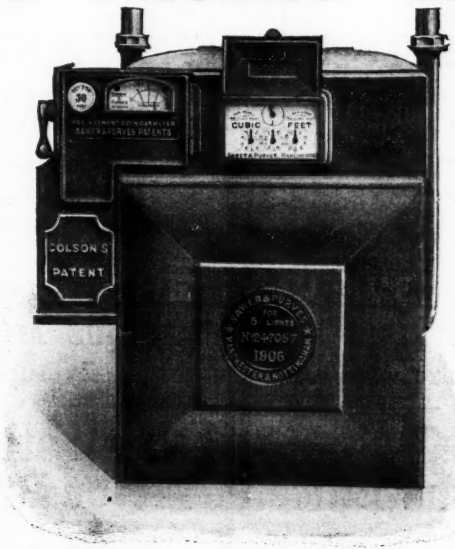
Saturday.

The Edinburgh and Leith Gas Commissioners engaged in the work of setting their house in order, at their meeting on Monday last. The subject came up in the form of a report by a Sub-Committee, to whom it had been remitted to consider as to the conditions of employment and emoluments of the officials of the Commission—the Manager, the Treasurer, the Collector, and the Clerk. New members, I presume, thought they could improve upon the arrangements which were made by their predecessors. They have been considering the subject for two or three months; and in the end have practically left matters as they were. In the course of the "investigation," a series of questions were put to the officials, which were by no means of a modest nature; and in reply to some of these, information was elicited which shows how greatly the business of the Gas Commission has increased. Thus the Treasurer—Mr. John S. Gibb—stated that the total value dealt with in the cash account during the five years ending May 15, 1896, was £4,107,164, giving an annual average of £821,433; and in the five years ending May 15, 1905, £10,848,167, giving an annual average of £2,169,633. The Collector—Mr. R. Cockburn—stated that the payments received in the year ending May 15, 1890, numbered 215,819; and in the year ending May 15, 1905, they numbered 321,261. The total revenue collected in the year ending May 15, 1890, was £209,015; and in the year ending May 15, 1905, it was £328,284. There had been an increase in the number of payments equal to 49 per cent., and in the amount of the total revenue equal to 57 per cent. The average percentage of bad debts since 1890 has been only 4s. 6d. In one of his answers, Mr. Herring pointed out that, apart from the great engineering work which has been accomplished (at Granton), the commercial success of the undertaking, with raw materials slightly higher in price, and with workmen's wages on a 10 per cent. higher scale, the gross profits had been increased from £38,000 in 1896 to £91,733 in 1905, to say nothing about the £23,500 per annum which the public enjoyed as a result of the reduction in the price of gas below its former lowest rate. I do not go into the matter further, because the conditions of employment are the private business of the officials; and to interest ourselves in them would be a species of busybodyism.

The Works Committee reported to the Commission that they had received communications from Messrs. William Younger and Co., Limited; Gordon and Blair, Limited; Thomas and James Bernard, Limited; Steel, Coulson, and Co., Limited; and Mr. Thos. Carmichael, all brewers in Edinburgh, urging the Commissioners to adopt measures to prevent pollution from the Commissioners' property, or from the property of Messrs. James Muir and Son, Limited, escaping into other brewery wells, and that they had replied that they were to move the Court for an order to have the well in Messrs. Muir's brewery cleaned out. The motion was made the other day, and, as reported in the "JOURNAL" on May 29, p. 591, the Court refused it.

Prevention is better than Cure.

COLSON'S PATENT CASH BOX



THE BEST SAFEGUARD AGAINST THEFT.

NO MORE BROKEN CASH BOXES.

CAN NOW BE FITTED TO "THE POSITIVE" PREPAYMENT METER.

SAWER AND PURVES

MANCHESTER AND NOTTINGHAM.

As foreshadowed last week, the gas accounts of the Corporation of Dundee for the past year have turned out very favourably. There was a total revenue of £108,545, which was £1170 in excess of the revenue for the preceding twelve months. There was derived from the sale of gas £84,871, a decrease of £1423; the decrease being due to the reduction of 2d. per 1000 cubic feet of gas made a year ago, the revenue from which amounted to £10,963, an increase of £1735; from sulphate of ammonia £8497, an increase of £1308; and from tar £3118, an increase of £135. The expenditure upon the production and distribution of gas amounted to £82,807, leaving a balance of £25,737, to which there falls to be added £1204 brought forward; making a total of £26,941 available for administration charges. These amount to £6246 of annuities, £8000 of interest, and £11,081 carried to sinking fund; leaving £1614 to be carried forward. The total quantity of gas sold was 715,951,800 cubic feet, made up of 633,610,800 cubic feet of coal gas and 62,341,000 cubic feet of carburetted water gas. The output of gas is greater by 32,073,600 cubic feet than it was in the preceding year, when it showed a decrease of about 22 million cubic feet. During the past year 64,240 tons of coal were carbonized, from which the yield of gas was equal to 10,174 cubic feet per ton. The cost of production was at the rate of 13s. 4·39d. per ton of coal and benzol used, equal to 1s. 3·50d. per 1000 cubic feet of gas made. The consumers numbered 45,435—an increase of 1796. Those who use cookers, &c., number 5784—an increase of 3520. The estimates for the current year have been framed, which provide for an output of gas to the amount of 735,807,000 cubic feet, requiring 69,470 tons of coal and 75,000 gallons of benzol. The expenditure is estimated at £105,052; and an apparent surplus is brought out of £1691. As stated last week, it is proposed to reduce the price of gas by 2d.; making it 2s. 6d. per 1000 cubic feet to ordinary consumers, and 2s. 3d. for power purposes.

The Aberdeen Gas and Electricity Committee had before them at a meeting on Thursday tenders for the supply of gas coal for the year; and they authorized contracts to be entered into for 67,000 tons, at an average price of 15s. 7½d. per ton delivered. The Convener—Mr. G. Kemp—reported that, in the opinion of the exhibitors, the gas exhibition recently held in the city had been a great success. At the close of the exhibition they had received orders for 1000 gas cookers and stoves; and since then orders had been continuously coming in. On the motion of Lord Provost Lyon, the Convener and the Gas Engineer were heartily thanked for the trouble they had taken in connection with what his Lordship termed an undoubtedly first-class exhibition. The Committee agreed to recommend that an honorarium of £200 be voted to Mr. S. Milne, the Manager, in respect of extra work performed by him in connection with his department.

Although the gas accounts of the Corporation of Arbroath have not yet been formally before the Town Council, it is understood that they will show a surplus on the year. It is, however, stated that the price to be paid for coal this year will be higher than last year, and that the surplus will, consequently, not be sufficient to warrant a reduction in the price of gas.

CURRENT SALES OF GAS PRODUCTS.

Week ending June 2.

The market for London tar products remains unchanged. The quantities of pitch exported during the season now closing compare favourably with the former season. For forward, there is now less difference between buyers and sellers' views than before; the makers' firm attitude having caused the improvement. Sulphate of ammonia continues to receive but little attention, and there is no alteration to report.

LIVERPOOL, *June* 1.

Sulphate of Ammonia.

The month of May has closed with a very quiet tone, all immediate requirements having been covered, and buyers being in no hurry with regard to June. The closing quotations are £12 per ton f.o.b. Hull and Liverpool, and £12 2s. 6d. per ton f.o.b. Leith. In the forward position there is more anxiety on the part of makers to effect sales, while, on the other hand, buyers remain for the most part quite indifferent. £12 2s. 6d. to £12 5s. per ton, according to make and position, is being quoted, but speculative sales abroad are reported at the equivalent of £12 per ton f.o.b.

Nitrate of Soda.

Spot quotations are now 11s. per cwt. for 95 per cent., and 11s. 3d. per cwt. for refined quality; and the concession in price is inducing a larger business.

LONDON, *June* 2.

Tar Products.

The tar products market is quiet; no doubt owing, in a measure, to the approach of the Whitsuntide Holidays. Pitch remains in about the same position, and there is not much doing. Prices are, if anything, a little easier for prompt, as makers seem anxious to clear out their stocks before the very hot weather sets in. It is reported that 26s. has been accepted on the east coast at a good port; while London dealers state they have bought a little London stuff for June shipment at 27s. For next season makers will not consider reasonable prices, and ask 31s 6d. to 32s.; and makers in Yorkshire would probably want 28s. 6d. for this delivery. In South Wales, there is some demand for prompt, and one or two contracts have been arranged at fair prices. As to creosote, the demand for London oil still continues good. One maker is reported to have accepted 1⅛d., but would probably require 2d. for any further quantity; while the largest producers ask 2d. to 2⅛d., and do not appear at all anxious to sell. Sales are reported in Yorkshire at 1⅞d. to 1¾d. for June delivery; and one maker is reported to have declined 1 11/16d. forward. It is difficult to ascertain the price at which oil could be obtained in the Lancashire district, as it would appear that the bulk of the make has been sold for

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MAXIM PATENT CARBURETTOR

FOR ENRICHING GAS IN BULK.

PREVENTS NAPHTHALENE DEPOSITS.

OVER **120** MAXIM PATENT CARBURETTORS HAVE NOW BEEN FIXED.

Among the Companies and Towns supplied are The Gaslight and Coke Company, Manchester Exeter, Birmingham, Leeds, Rochdale, Bristol, Sheffield, Oldham, Dundee, Perth, Dunfermline, and many other Works, both large and small, where they have been working in some instances for the past **Ten Years.**

MORE GAS & SALEABLE COKE PER TON of COAL CARBONIZED is PRODUCED; SAVING CAPITAL, LABOUR, FUEL, WEAR & TEAR, &c.

THE ENRICHMENT IS INSTANTANEOUS AND PERMANENT.

The Carburettor is inexpensive, easily fixed, and entirely supersedes the use of Cannel.

Dealers in Benzol, Carburine, and all other Naphthas and Oils suitable for the Enrichment or Production of Gas.

For Prices and full Particulars, apply to

THE GAS LIGHTING IMPROVEMENT COMPANY, LIMITED,

7, BISHOPSGATE STREET WITHOUT, LONDON, E.C.

delivery to America. Carbolic acid remains in about the same position, but there is a decidedly quiet tone all round. There are now sellers of 60's for July-December delivery at 1s. 9¾d. on the east coast; but foreign consumers do not appear anxious to contract beyond September, though it is probable that the English buyers would purchase for delivery to the end of the year at reasonable prices. In crystals, the German makers are still reported to be sellers at low prices. In solvent naphtha, the demand still continues good for home consumption, especially for 95 per cent. at 160°, for which 1s. 2d. has been paid for forward delivery; while for ordinary 90 per cent. at 160° about 1s. 1d. could no doubt be obtained for prompt. There appears to be rather more offering in the North of England; and it is just possible that sellers would be disposed to accept 11d. on the east coast over the last six months of the year. A small quantity of toluol is reported to have been sold for early delivery at 1s. 1d.; but makers still decline to entertain business forward. Benzol is quiet; and there does not appear to be much doing for home consumption, except for gas-enriching purposes. Sales are reported at 10¼d. to 10½d. London; but considerably under this has been accepted in the North of England. In 50-90 per cent., there is very little offering. Buyers appear willing to do business at 10d. for forward delivery, but makers will not consider anything like this price. There is nothing whatever doing in anthracene, and prices are purely nominal.

The average values during the week were: Tar, 15s. 6d. to 20s. Pitch, London, 27s. to 27s. 3d.; east coast, 26s. to 26s. 6d.; west coast, 25s. to 25s. 3d. Benzol, 90 per cent., 9¼d. to 9⅜d.; 50-90 per cent., 10d. to 10¼d. Toluol, 1s. 1d. Crude naphtha, 3¼d. to 4d.; solvent naphtha, 1s. 1d. to 1s. 1½d.; heavy naphtha, 11d. to 11⅜d. Creosote, London, 1⅞d.; North, 1½d. to 1⅝d. Heavy oils, 2¼d. Carbolic acid, 60 per cent., 1s. 9¼d. to 1s. 9½d. Refined naphthalene, £4 10s. to £8 10s.; salts, 18s. 6d. to 19s. Anthracene, "A" quality, 1½d. to 1⅝d.; "B" quality, unsaleable.

Sulphate of Ammonia.

The market is very quiet indeed, though there does not appear to be any important quantity offering. The Gaslight and Coke Company still maintain their nominal quotation of £12 7s. 6d.; but sellers would undoubtedly accept £12 on Beckton terms, and they might even be disposed to consider a little under this. In Hull, no business of importance has taken place. Small parcels of discoloured makes are reported to have been sold at under £12; while one or two makers appear disposed to sell for forward delivery at reasonable price. The position in Liverpool remains unchanged. Small parcels of inferior quality are reported to have changed hands at under £12, but value may be taken as from £12 to £12 2s. 6d., according to position. In Leith, makers are still holding out for last week's price—viz., £12 5s.; and at this figure they would probably be prepared to do a fair amount of business for forward delivery. It is reported that one maker, who was compelled to clear out a small parcel at the end of May, was obliged to accept rather under the figure mentioned.

COAL TRADE REPORTS.

Lancashire Coal Trade.

There is no alteration to report in the current average quotations of the various qualities of Lancashire coal. While it is true that better prices are being obtained from users of slack and steam fuel generally, lower prices are being taken for other sorts, which practically balances the two; and it was on these grounds that the Coal Conciliation Board, at their meeting in London a few days ago, based their resolve that the average prices of coal did not warrant any increase of miners' wages at the present time. Generally speaking, less gas coal and cannel are going out for carbonization. House coal also shows a falling off. Coke for furnace purposes is in steady request. Coal for shipping is steady. The outlook for slack before the summer is over points to still higher prices.

Northern Coal Trade.

After a period of dulness there is a slight recovery in the coal trade; the exports being a little fuller, and the production being likely to be very small for the next two or three weeks owing to the general and local holidays. The shipment of coals to the Baltic is heavier; and this has benefited the steam coal collieries, which have been working a little better. For best Northumbrians about 10s. to 10s. 3d. per ton f.o.b. is the current price, second-class steams are 9s. 9d. to 10s. 3d., and steam smalls are 6s. In gas coals, the tenders have now been sent in for the contracts for the Newcastle Gas Company; and it is probable that in the course of a week the allotment of quantities will take place—some increase in the prices being assured, but the exact figures quoted are not known. The shipment of gas coals are moderate, but will soon be enlarged, because fuller quantities are now taken in the summer months. Durham gas coals are now quoted from about 8s. 9d. to 9s. 9d. per ton f.o.b., according to quality—there being more free coal in the market at present, while there seems some slight increase in the producing facilities. In coke, the market is steadied by larger shipments; and this benefits gas coke. The production of the latter is now limited; but the demand is rather languid, and fair qualities are quoted from 10s. 3d. to 10s. 6d. per ton f.o.b. in the Tyne.

Scotch Coal Trade.

Trade is getting more slack as the season advances; not in respect of volume, which is quite satisfactory, but in the matter of price, which is not showing the elasticity that was expected. This will give the masters more confidence when they approach the question of wages, which has been raised by the men demanding an increase equal to 12½ per cent. The prices quoted are: Main 7s. 9d. to 8s. per ton f.o.b. Glasgow, ell 8s. 9d. to 10s., and splint 9s. 3d. to 9s. 6d. The shipments for the week amounted to 248,965 tons—a decrease of 36,928 tons upon the preceding week, but an increase of 2691 tons upon the same week of last year. For the year to date, the total shipments have been 5,316,859 tons—an increase of 655,810 tons upon the corresponding period of 1905.

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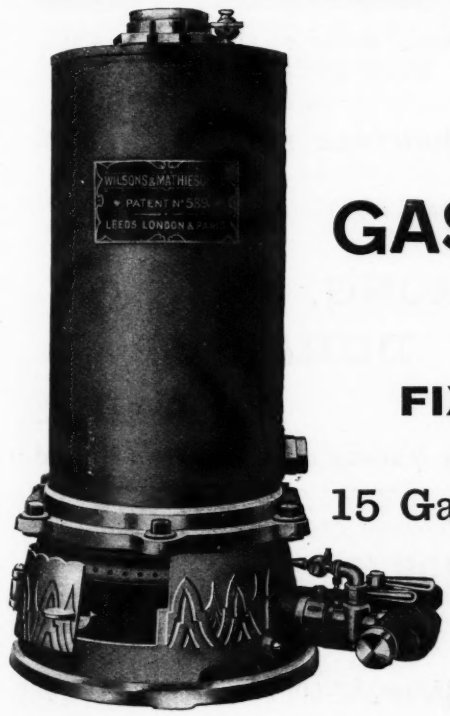

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Cheaper Gas at Todmorden.—Last Wednesday, at the monthly meeting of the Todmorden Town Council, the gas accounts for the year ended March 31 were submitted. They showed a gross profit of £9348; and of this sum, £6578 will be paid as dividend, interest, instalments to sinking and redemption funds, &c., leaving a net profit for the year of £2769, compared with £2801 for the previous twelve months. It was resolved that £2500 should be placed to the reserve fund; and that the price of gas should be reduced 3d. per 1000 cubic feet from July 1.

Manchester Land Purchase Arbitration.—Sir John Rolleston has made his award in the arbitration held some weeks ago between the Earl of Wilton and the Manchester Corporation (*ante*, p. 189), to determine the price to be paid for 70 acres of land near Heaton Park, on which it is intended to construct a service reservoir. The valuations of the Earl's witnesses varied between £45,000 and £56,000; while the figure submitted on behalf of the Corporation was about £12,500. The Umpire has fixed the price to be paid by the Corporation at £23,805.

Sale of Shares and Stock.—At the Mart, Tokenhouse Yard, last Tuesday, Mr. Alfred Richards placed two new issues by order of Directors. The first was an issue of 1200 new ordinary £10 shares (last dividend 5 per cent.) in the Southend Water Company, which fetched from £10 to £10 7s. 6d. each; and the second an issue of £10,000 of 3 per cent. perpetual debenture stock of the Wandsworth and Putney Gas Company, which was all sold at £81 to £81 12s. 6d. per £100 of stock. On the same occasion, he offered a few £10 fully-paid original shares in the Melton Mowbray Gas Company, Limited, carrying a dividend of 7½ per cent., free of income-tax; and they fetched £30 apiece.

Cairo Water Supply.—Mr. Astley Friend, the Manager of the Cairo Water Company, writing in the "Egyptian Gazette," states that the new artesian installation at Rod el Farag, originally intended for 13 wells, has been increased to 22 wells and made capable of supplying 22 million gallons per day. The cost of this development has been about £E120,000 to £E130,000. The volume of water is considered adequate for the present; but it is stated that the mains are incapable of withstanding the increased pressure. It will therefore be necessary to relay the greater part of them; and the Company propose this summer to spend several thousands of pounds on pipes for this purpose. As there are 100 miles of pipes laid in Cairo, the undertaking is a considerable one.

False Economy in Street Lighting.—At a recent meeting of the Barnstaple Town Council, the Mayor (Mr. H. Barrett), in moving the approval of a general district rate, congratulated the members on the fact that the estimated balance had been increased by £631 19s. 4d., which had been largely brought about by reductions under the heads of public lighting and roads and streets. During last winter, the lamps were put out at midnight, and a saving of nearly £350 was thereby effected. Mr. Ashton criticized the plan of extinguishing public lamps at midnight, and said it encouraged burglary. Moreover, what was the use of the police patrolling the town in darkness? Mr. Pearce agreed, and said darkness was unsafe and an incentive to wrong-doing. Although money might have been saved by extinguishing the public lamps at midnight, he regarded it as false economy.

Staffordshire Potteries Water-Works.—The report which was adopted at the sixtieth annual meeting of the Staffordshire Potteries Water-Works Company last Wednesday stated that the water revenue for the year was £57,584, or an increase of £1485. The profit on revenue account was £29,243. After providing for the interim dividend paid in December, there remained a balance of £15,785, which the Directors recommended should be appropriated as follows: (*a*) To the payment of a dividend at the rate of 10 per cent. per annum on the consolidated ordinary stock (free of income-tax), making 9½ per cent. for the year, £12,250; (*b*) to the payment of a dividend at the rate of 7 per cent. per annum on the consolidated new ordinary stock (less income-tax), making 7 per cent. for the year, £2631; (*c*) to be transferred to reserve for voids and abatements, £200; and (*d*) balance for transfer to depreciation and contingent fund account, £704.

Charge of Embezzlement at Smethwick.—At the Smethwick Police Court last week, Alfred Alder was charged with embezzling various sums belonging to the Corporation. Mr. W. J. Sturges, the Secretary to the Gas Department, stated that the prisoner entered the employ of the Corporation in 1892 as timekeeper and weighing-machine clerk. He received the amounts paid for cash sales of coke, tar, and other residual products at the gas-works. In consequence of irregularities, witness suspended prisoner in 1900; and a warrant was issued for his arrest. He, however, absconded. Accused was receiving £1 10s. a week wages. The defalcations amounted to £88 16s. 3d.; and the prisoner had been probably carrying on the practices for two years. Prisoner pleaded that his wife was ill and bedridden for nearly two years; and most of the money he embezzled went in paying doctors' bills. At length, he gave way to drink. He was sentenced to six months' hard labour.

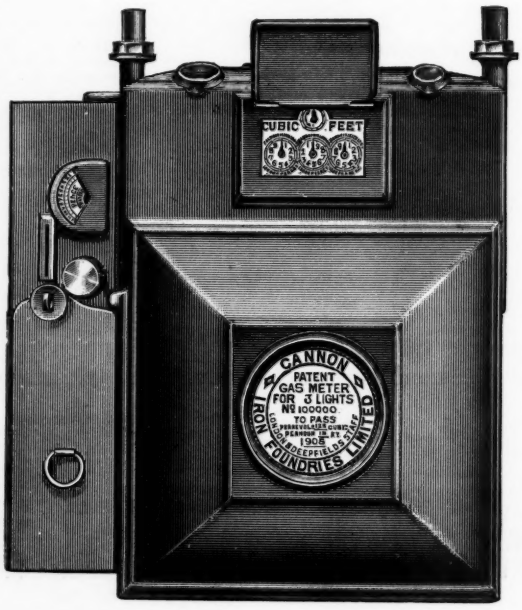
Lunch at a Gas-Works Inspection.—A proposal that luncheon should be provided on the occasion of a visit of the Leeds City Council to the gas-works during the present month, met with opposition from four of the members. One of them asked where the money was to come from; and the Chairman of the Committee replied that it would be taken out of the profits of the gas-works. The Town Clerk said he thought that, on a strict audit, it would be a questionable item. Mr. Wilson said he did not think the ratepayers objected in the least to such reasonable expenditure. The privileges of councillors were few enough for all the time they gave to the public service. Mr. Ratcliffe pointed out that, as a matter of business, it was desirable that the visit should take place in the manner proposed. Here was upwards of £1,000,000 sunk in the gas-works; and it was well worth the while of councillors being acquainted with them. The amendment that the lunch "be not sanctioned" was lost by an overwhelming majority.

"CANNON"

PREPAYMENT

GAS METERS

DRY AND WET.



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Lighting of Sidmouth.—After a good deal of negotiation, an agreement has been entered into between the Sidmouth Urban District Council and the Gas Company for the lighting of the town. Serious complaint was made by the Company of the damage done to their mains and services by the Council's road-roller. The Council finally came to see the reasonableness of the Company's contention, and undertook to give careful consideration to any feasible suggestion with regard to the use of the roller. The new lighting agreement is for five years.

The Auxiliary Water Supply for Lincoln.—The supply of Willoughby water to Lincoln has now ceased. The water has been supplied by rail for about fourteen months; and with the view of avoiding the heavy expense of carriage, the Town Council decided to discontinue it, and to substitute water from ballast-pits at Lincoln. The latter water will be distributed in carts to various parts of the city; and, with an augmentation of it from Hartsholme Lake, it is hoped that it will be sufficient for the domestic requirements of the citizens until water from the Boultham boring is available.

High-Pressure Gas Lighting at Port Elizabeth.—We learn from a local paper that there has just been laid down a new system of high-pressure gas lighting for the Terminus Station, Port Elizabeth. The departure platform is now lit by five 800-candle power lamps on each platform, two 400-candle burners to each lamp. They light up the whole station with remarkable brilliancy. The South African Lighting Association are putting in the plant, which consists of a gas-engine of ½-horse power, which draws the gas from the main and compresses it to about 40 inches by the aid of a rotary blower.

Coventry Water Undertaking.—This year's report upon the water undertaking of the Coventry Corporation shows a profit on the twelve months' business of £4030. The Committee have agreed to recommend to the Council that £4000 should be handed over to the borough fund in relief of the rates. This is the same amount as was paid over last year, when the profits were only £2166. The receipts have shown a remarkable increase in recent years. The Committee have had under consideration the question of fresh sources of supply to meet the growing needs of the city; and it is expected that before long an important report upon the subject will be forthcoming.

After the Earthquake at San Francisco.—The last number of the "American Gaslight Journal" to hand contains the following despatch from San Francisco, dated the 6th ult.: "The San Francisco Gas and Electric Company has repaired its plants at the two Potrero stations and at the Martin station south of the Six Mile House, and is now ready, its Managers announce, to turn the gas into the mains of the city whenever the authorities say the word. The United States Mint and the General Post Office are to be supplied with gas at once, as the mains supplying them have been overhauled and repaired. The burned district generally will not be supplied with gas, however, until some time later."

Checking Waste of Water in Massachusetts.—The prevention of waste of water in Massachusetts has reached, says "Engineering Record," a condition of the same importance that it has long held in Great Britain. The manufacturers along the Ware River, employing from 25,000 to 35,000 people, view with alarm the prospect of an appropriation of a large part of the water of the river for the communities supplied from the Metropolitan Water-Works, and they have accordingly secured the passing of a Bill which will ensure the prevention of waste. These manufacturers acknowledge that the legitimate requirements of cities must be met; but they protest against the construction of works taking the water they want in their industries, if this water is subsequently largely wasted. The Metropolitan Board have stated that if the waste of water is checked the construction of new works can probably be deferred for a considerable term of years; and the experience of communities supplied with water by the Board affords striking proof of the accuracy of this statement. Moreover, it seems that the introduction of meters had not only reduced the waste of water, but has also resulted in some cases in a lowering of the cost of the supply to individual consumers. The new Act requires all cities taking their water supply from outside their limits to meter every new service installed, and of the unmetered services on Jan. 1, 1907, 5 per cent. must be metered annually.

At the meeting of the London County Council last Tuesday, an estimate of £2000 submitted by the Finance Committee for gas-meter testing for the financial year, 1906-7, was approved.

The Chepstow Gas Company, Limited, have decided to replace their bench of direct fires by regenerator settings, and have given an order for a new bench complete with ironwork to Messrs. F. C. Sugden and Co., of Leeds. Other recent orders in the same district for regenerator settings have been received from the Bridgend and the Cwmbran Gas Companies; the latter being a second repeat order.

A miniature rifle-range, which has been fitted up for the employees of the Newcastle-on-Tyne and Gateshead Gas Company, was opened last week by the Chairman, Sir W. H. Stephenson. The new building is of brick, with corrugated iron roof, and is of the approved shape and length. At present there are eight targets abreast; but moving and disappearing targets will be installed in due course. Table games and periodicals are also to be added to the attractions. A numerous company assembled to witness the opening ceremony; the chair being occupied by the Secretary, Mr. T. Waddom, who was supported by other officials.

An admirable display of gas apparatus was on view for several days during the past week at the Thorngate Hall, Gosport (Hants); the most prominent features being the Lucas light, inverted burners, stoves, baths, radiators, washing-machines, coppers, and a model kitchen. Large audiences were also present at the series of cookery lectures by Miss Gertrude Lees. At the opening ceremony, an appropriate and telling address was delivered by Mr. George Cooke, who said that as a cooking medium he could recommend gas for four reasons—it saved money, trouble, time, and temper. The Gas Company had not only reduced their price, but were willing to fit up kitchens on the consumer agreeing to pay for the gas on the penny-in-the-slot system.

"CARRON"
COOKERS

As soundly constructed
and carefully finished
as the "Carronades"
made for the
Government over
a century
ago.

CARRON COMPANY
ESTD PERPETUA
FOUNDED 1759
INCORPORATED BY ROYAL CHARTER 1773

Hired out
by the leading Gas
Companies and Corporations.

Full Particulars on application to

Carron Company
INCORPORATED BY ROYAL CHARTER 1773

CARRON WORKS, Stirlingshire.

WANTED, FOR SALE, CONTRACT, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Situations Vacant.

ASSISTANT SUPERINTENDENT (CANADA). Box 2396. Montreal.
GAS ENGINEER WITH ELECTRICAL KNOWLEDGE FOR QUEENSLAND. Coward and Co., London.
DESIGNING ENGINEER. No. 4610.
ENGINEER (THIRD) IN ARGENTINA. Hugo Brown and Co., Liverpool.
WORKING MANAGER (MIDLANDS). S. While and Son, London.
GENERAL FOREMAN (GAS-WORKS). Whitwood Collieries.
GAS FITTER. No. 4609.

Plant, &c., for Sale.

CONDENSER TUBES. East Retford Gas Department.
CONDENSERS, MOUTHPIECES, COLUMNS, GASHOLDER, &c. Hull Gas-Works.
PURIFYING MACHINE, TAR-EXTRACTOR, AND ENGINE. Cannock, Hednesford, and District Gas Company.

Stocks and Shares.

BROMLEY GAS COMPANY. June 21.
CROYDON GAS COMPANY. June 7.
NORTH PEMBROKE WATER AND GAS COMPANY. June 13.
SLOUGH GAS COMPANY. June 28.
SOUTH ESSEX WATER COMPANY. June 12.
WALKER AND WALLSEND GAS COMPANY. June 8.
WESTGATE AND BIRCHINGTON GAS COMPANY. June 12.
WORTHING GASLIGHT COMPANY. June 12.

Company Meeting.

MALTA AND MEDITERRANEAN GAS COMPANY. Offices, June 19. Twelve o'clock.

TENDERS FOR

Coal and Cannel.

BEVERLEY GAS DEPARTMENT. Tenders by June 27.
BURY GAS DEPARTMENT. Tenders by June 15.
FENTON URBAN DISTRICT COUNCIL. Tenders by June 14.
HAVERHILL URBAN DISTRICT COUNCIL. Tenders by June 12.
HEBDEN BRIDGE &c., GAS BOARD. Tenders by June 13.
LANCASTER GAS DEPARTMENT. Tenders by June 15.
NEWCASTLE-UNDER-LYME. Tenders by June 11.
ROTHERHAM GAS DEPARTMENT. Tenders by June 11.
TAUNTON GAS COMPANY. Tenders by June 12.
TENTERDEN GAS COMPANY. Tenders by June 15.

Coke.

CANTERBURY GAS AND WATER COMPANY. Tenders by June 9.

Condensers, &c.

LYMM GAS DEPARTMENT. Tenders by June 20.

Lime.

KEIGHLEY GAS DEPARTMENT. Tenders by June 11.

Oil for Gas Making.

TAUNTON GAS COMPANY. Tenders by June 12.

Oxide of Iron.

KEIGHLEY GAS DEPARTMENT. Tenders by June 11.
STOKE-ON-TRENT GAS DEPARTMENT. Tenders by June 12.

Retort-House and Settings, &c.

RHONDDA GAS AND WATER DEPARTMENT. Tenders by June 14.

Sulphuric Acid.

KEIGHLEY GAS DEPARTMENT. Tenders by June 11.

Sulphate of Ammonia.

ISLE OF THANET GAS COMPANY. Tenders by June 14.

Tar and Liquor, &c.

ACCRINGTON GAS AND WATER BOARD. Tenders by June 12.
BRIDGEWATER COLLIERIES COKE WORKS. Tenders by June 25.
FENTON URBAN DISTRICT COUNCIL. Tenders by June 14.
GREAT WESTERN RAILWAY COMPANY. Tenders by June 12.
LOUGHBOROUGH GAS DEPARTMENT. Tenders by June 23.
NEWCASTLE-UNDER-LYME GAS DEPARTMENT. Tenders June 11.
OLDHAM GAS DEPARTMENT. Tenders by June 12.
STOURBRIDGE GAS DEPARTMENT. Tenders by June 12.

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer; not necessarily for publication, but as a proof of good faith

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders for Alterations in, or stoppages of, PERMANENT ADVERTISEMENTS should be received by the FIRST POST on SATURDAY.

Wanted, For Sale, and Tender Advertisements, Six Lines and under, 3s.; each additional Line, 6d.

TERMS OF SUBSCRIPTION to the "JOURNAL."

United Kingdom: One Year 21s.; Half Year, 10s. 6d.; Quarter, 6s. 6d.
Payable in Advance. If credit is taken, the charge is 25s. a year.
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All Communications, Remittances, &c., to be addressed to WALTER KING, 11, BOLT COURT, FLEET STREET, LONDON, E.C.
Telegrams: "GASKING, LONDON." Telephone: P.O. 1571a Central.

OXIDE OF IRON.

O'NEILL'S OXIDE
For GAS PURIFICATION.
LARGEST SALE OF ANY OXIDE.

SPENT OXIDE PURCHASED IN ANY DISTRICT.

GAS PURIFICATION & CHEMICAL CO., LD.
PALMERSTON HOUSE,
OLD BROAD STREET, LONDON, E.C.

WINKELMANN'S
"VOLCANIC" FIRE CEMENT.
Resists 4500° Fahr. Best for GAS-WORKS.
ANDREW STEPHENSON, 182, Palmerston House, Old Broad Street, London, E.C. "Volcanism London."

BROTHERTON & CO., LIMITED.
Offices: Commercial Buildings, LEEDS.
Correspondence invited.

"NUGEPE" GAS PLANT CEMENT.
JOHN E. WILLIAMS AND CO.,
LOWER MOSS LANE,
MANCHESTER, S.W.
For all Joints in connection with Oil-Gas Plant and Sulphate Plant.
For all Gas Joints.
For all Tar Joints.
For all Ammonia Joints.

THE KEITH LIGHT.
OVER 3000 INSTALLATIONS IN DAILY USE.
SEE illustrated advertisement in next week's issue.
JAMES KEITH AND BLACKMAN CO., LTD., 27, Farringdon Avenue, LONDON, E.C.

GAZINE—A radical Solvent and Preventative of Naphthalene deposits, which has been used for many years on the Continent for the cleaning of Mains and Services, and is now being adopted in England. It is also used for the Enrichment of Gas, and has an Illuminating Value of double that of 90 per cent. Benzol.
Supplied by C. BOURNE, 190, Manor House Road, NEWCASTLE-ON-TYNE.

GASHOLDER PAINTING.
PAINTING Work for all kinds of Gas-Works Plant, Roofs, Bridges, &c., undertaken by Contract or otherwise.
FREDERICK BOYALL, 31, Regent's ROW, DALSTON, N.E.

GAS TAR wanted.
BROTHERTON AND CO., LTD., Tar Distillers.
Works: BIRMINGHAM, GLASGOW, LEEDS, LIVERPOOL, AND WAKEFIELD.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 54 & 47, Westminster Bridge Road, LONDON, S.E.
WET AND DRY GAS-METERS, PREPAYMENT METERS, STATION METERS, AND GOVERNORS.
REPAIRS RECEIVE PROMPT ATTENTION.
Telephones: 254 Oldham, and 2412 HOP, London.
Telegrams:—
"BRADDOCK, OLDHAM," and "METRIQUE, LONDON."

DUTCH OXIDE OF IRON.

SPENT OXIDE PURCHASED IN ANY DISTRICT.

THE First Dutch Bogore Co., Ltd.,
HOLLAND.
General Manager (for England and Wales)—
CHARLES E. FRY, LEAMINGTON.
General Manager (for Scotland)—
J. B. MACDERMOTT, 11, Bothwell St., GLASGOW.

TEMPERLEY TRANSPORTERS
FOR Rapid and Economical Handling of Coal and Coke in Gas-Works.
Next Illustrated Advertisement will appear on June 26.
TEMPERLEY TRANSPORTER COMPANY,
72, BISHOPSGATE STREET WITHIN, LONDON, E.C.
Telephone: 365 LONDON WALL. Telegrams: "TRANSUMO."

SULPHURIC ACID for Sale, specially suitable for making Sulphate of Ammonia.
BROTHERTON AND CO., LTD., Chemical Manufacturers.
Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

SULPHATE OF AMMONIA SATURATORS and all LEAD and TIMBER WORK in Connection with Sulphate Plants.
We guarantee promptness, with efficiency for Repairs.
JOSEPH TAYLOR AND CO., CENTRAL PLUMBING WORKS, BOLTON.
Telegrams: SATURATORS, BOLTON. Telephone 0848.

HYDRATED OXIDE OF IRON.
PREPARED from Pure Iron.
Twice as Rich as Bog Ore.
Gives no Back Pressure.
The Cheapest in the Market.
Can be Exchanged for Spent Oxide.
READ HOLLIDAY AND SONS, LTD., HUDDERSFIELD.

AMMONIACAL Liquor wanted.
BROTHERTON AND CO., LTD., Ammonia Distillers.
Works: BIRMINGHAM, GLASGOW, LEEDS, LIVERPOOL, AND WAKEFIELD.

TAR AND LIQUOR WANTED.
Best Prices paid.
DENT AND CO.,
Ouse Chemical Works, SELBY.

OXIDE OF IRON.

(NATURAL.)
SPENT OXIDE PURCHASED.
BALE'S FIRE CEMENT.
PAINT FOR GAS-WORKS.
BALE & CHURCH,
5, CROOKED LANE, LONDON, E.C.

SULPHURIC ACID.

SPECIALLY prepared for the Manufacture of SULPHATE OF AMMONIA.
SPENCER, CHAPMAN, & MESSEL, LTD.
(with which is amalgamated WM. PEARCE & SONS, LTD.),
36, Mark Lane, LONDON, E.C. Works: SILVERTOWN.
Telegrams: "HYDROCHLORIC, LONDON."
Telephone 341, AVENUE.

PATENTS AND TRADE MARKS PUBLICATIONS, "MERCHANDISE MARKS ACT, and Decisions thereunder," 1s.; "TRADE SECRETS v. PATENTS," 6d.; "DOCTRINE of EQUIVALENTS, Mechanical and Chemical," 6d.; SUBJECT-MATTER of PATENTS," 6d.
MEWBURN, ELLIS, & PRYOR, Chartered Patent Agents, 70 and 72, Chancery Lane, London, W.C. Telegrams: "Patent London." Telephone: No. 243 Holborn.

APPLICANTS for the post advertised under No. 4594 are THANKED, and informed that the POSITION HAS BEEN FILLED.

WANTED, an Assistant-Superintendent for Gas Plant in Canada, Carbonizing 100,000 tons of coal annually.
Applicants must give full details of past Experience, Qualifications, and Accomplishments, also Age, References, and Salary expected, to Box 2396, Montreal-CANADA.

GAS FITTER—Good, reliable Man wanted.
Apply, stating Age, and Wages required, to No. 4609, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

GAS Engineer, with Electrical knowledge, required by a Gas Company in Queensland, also supplying Electric Light.
Apply, stating Age, Qualifications, and Salary required (House, Gas, and Coal free), to WM. COWARD AND CO., 91, Finsbury Pavement, LONDON, E.C.

WANTED, a Designing Engineer for Constructional and General Engineering Works. Must be capable of Taking out Stresses and Making up Quantities and Drawings smartly for Estimates. One having knowledge of Gas-Works Plant preferred. Permanency for right Man.
Apply, stating Age, Salary required, and when free, to No. 4610, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

ROBERT DEMPSTER & SONS, Ltd., Contractors for Complete CARBONIZING PLANTS and every description of GAS APPARATUS and ELEVATING and CONVEYING PLANT, ROSE MOUNT IRON-WORKS ELLAND.

WORKING Manager wanted, to take ENTIRE CHARGE of Gas-Works in the Midlands making 1½ Million cubic feet per annum. Must have had a similar position before. Wages about 24s. per week, with House, Coal, and Gas free.
Apply to SAML. WHILE & SON, 60, QUEEN VICTORIA STREET, E.C.

WANTED, General Foreman to take full charge of Gas-Works, making about 500,000 cubic feet per week, and the Distribution, including the Collection of Accounts.
Apply, stating Age, Experience, and giving names of References with Salary required to ISAAC HODGES, Whitwood Collieries, Normanton, YORKS.

WANTED, a Young Man as Third ENGINEER for the Gas-Works, Rosario, Argentina. Must be good Draughtsman, and have been trained in a good Gas-Works in the United Kingdom, and thoroughly up in all matters relating to the work of a Gas-Works and Street Lighting. Passage Paid. Lodging free, but not board, with £150 first, £180 second, and £200 third year.
Apply, by letter, or personally between the hours of Twelve and One p.m., to HUGO BROWN AND CO., 14, Dale Street, LIVERPOOL.

WANTED, Copper Scrap, 72s.; Brass, 48s.; Zinc, 16s.; Lead Ashes, 8s. Also old Wet Gas-Meters bought.
ROSSE WORKS, Leeds Road, BRADFORD.

FOR SALE, Cheap—24-inch Specials, Bends, Tees, Elbows, and 24-inch Valves. All in good condition. Makers, Newton, Chambers, & Co.
Apply T. DUXBURY AND CO., MANCHESTER.

PURIFIERS for Sale. Splendid set of Four 10-feet square Boxes, planed joints, new Covers. Re-erected cheap for immediate sale.
Also sets of 12-feet, 16-feet, 20-feet, and 30-feet square PURIFIERS, erected Complete and Perfect.
FIRTH BLAKELEY, Thornhill, DEWSBURY.

GAS PLANT for Sale—I can always offer NEW and SECOND-HAND GAS APPARATUS, including Retorts and Fittings, Condensers, Exhausters. Scrubbers, Washers, Purifiers, Gasholders, Tanks, Valves, Connections, &c. Also a few COMPLETE WORKS. Compare Prices and Particulars before ordering elsewhere.
J. F. BLAKELEY, Gas Engineer, Thornhill, DEWSBURY.

FOR SALE—A Set of Three Second- Hand Wrought-Iron CONDENSER TUBES, 3 ft. 3 in. diameter, 16 ft. high, with Cast-Iron Tar-Boxes complete.
Particulars from J. B. FENWICK, Gas and Water Engineer, RETFORD.

CANNOCK, HEDNESFORD AND DISTRICT GAS COMPANY, LIMITED.

FOR SALE—C. & W. Walker's Purifying MACHINE with TAR-EXTRACTOR, 10-inch Valves and Connections complete with Engine to pass 200,000 cubic feet of Gas per Twenty-four hours.
The above Machine may be seen working, and is being replaced by a larger one.
T. A. NICHOLLS, Secretary.
Gas-Works, Cannock.

GAS PLANT AND FITTINGS.

THE following Plant and Fittings, re- placed by extension of Works, are FOR SALE on the Gas-Works, St. Mark Street, Groves, Hull—viz.:
One Set ANNULAR ATMOSPHERICAL CONDENSERS (4 Tubes). Height, 30 inches; diameter, Outer Tube, 42 inches, and of Inner Tube 33 inches. Diagonals, 12 inch diameter. Inlet and Outlets, 16 inches diameter. Complete with Rack and Pinion and Bye-Pass Valves.
36 SELF-SEALING MOUTHPIECES, Oval, 21 in. by 15 in. with Centre and Right-Hand Sockets.
60 SELF-SEALING MOUTHPIECES, "D" Oval, 24 in. by 15 in. with Right-Hand and Left-Hand Sockets.
Eight CAST-IRON COLUMNS, with One Tier of Lattice Girders. Also 78 feet diameter Two-Lift GASHOLDER. Height of Columns, about 38 ft., diameter at base, 1 ft. 10 in.
Further Details may be obtained on application, or the Plant may be viewed on the Works by appointment.
Tenders (to include Dismantling and all costs of Removal, Conveyance, &c., from the Company's Works) to be addressed to the Secretary, Gas Offices, St. Mark Street, Hull, endorsed "Tender for Disused Plant," not later than noon on Wednesday the 27th curt.
JOHN HOLLIDAY, Engineer.
June 1, 1906.

COUNTY BOROUGH OF OLDHAM.

THE Gas-Works Committee invite TENDERS for the TAR to be produced at their different Gas-Stations for a period of One Year, commencing the 1st of July next.
The yearly make of Tar is about 7500 Tons.
Particulars and Forms of Tender can be obtained on application to Mr. Arthur Andrew, Gas and Water Offices, Oldham, to whom Tenders are to be sent on or before Tuesday, June 12, 1906.
J. H. HALLSWORTH, Town Clerk.
Oldham, May 26, 1906.

THE
Institution
OF
Gas Engineers.

THE
ANNUAL GENERAL MEETING
WILL BE HELD ON
TUESDAY (10.30 a.m.), WEDNESDAY (10 a.m.), and THURSDAY (10 a.m.)
June 19th, 20th, and 21st,
AT THE
INSTITUTION OF MECHANICAL ENGINEERS,
STOREY'S GATE, ST. JAMES'S PARK, WESTMINSTER, S.W.,
By kind permission of the Council of that Institution.

THE CHAIR WILL BE TAKEN BY THE PRESIDENT,
CHARLES WOOD, Esq., F.C.S.

In connection with the Meeting, an Excursion to Boulogne has been arranged for Friday, 22nd June. Full Particulars are announced in the Programme.

THE BENEVOLENT FUND.

The Annual General Meeting of the Contributors to the Benevolent Fund will be held on Wednesday, 20th June, at 10 a.m.
WALTER T. DUNN, Secretary.
39, Victoria Street, Westminster.

TAUNTON GASLIGHT AND COKE COMPANY.

THE Directors are prepared to receive TENDERS for the supply of GAS COAL over a period of either One or Two Years from the 1st of July next.
Particulars may be obtained of the Secretary, to whom sealed TENDERS are to be delivered not later than June 12 next.
A. EDWARDS, Secretary and Manager.
May 31, 1906.

TAUNTON GASLIGHT AND COKE COMPANY.

TENDERS FOR GAS-OIL.

THE Directors are prepared to receive TENDERS for GAS OIL, for delivery over One or Two Years, from July 1 next.
Estimated Annual requirement, 300 Tons.
Tenders, giving full Particulars, to be sent to the Secretary by noon on June 12 next.
A. EDWARDS, Secretary and Manager.
May 31, 1906.

CANTERBURY GAS AND WATER COMPANY.

COKE.

TENDERS are invited for the purchase of 1000 Tons of Surplus COKE, to be delivered free on rail at Canterbury, during a Year from the 1st of July next.
Tenders to be delivered at the Company's Office on or before the 9th of June next.
JAMES BURCH, Secretary and General Manager.
Canterbury, May 31, 1906.

COUNTY BOROUGH OF ROTHERHAM.

THE Corporation invite Tenders for the supply and delivery, at the Gas-Works, Frederick Street, Rotherham, of 23,000 Tons of COAL and NUTS suitable for Gas Manufacturing Purposes.
Specification and Form of Tender can be obtained on application to the Gas Engineer.
Sealed Tenders to be sent to me not later than June 11, endorsed "Tender for Gas Coal."
The Corporation do not bind themselves to accept the lowest or any Tender.
By order, W. J. BOARD, Town Clerk.

RHONDDA URBAN DISTRICT COUNCIL.
(GAS AND WATER DEPARTMENT.)

THIS Council are prepared to receive TENDERS for the erection of a RETORT HOUSE and an installation of Three TUBULAR REGENERATORS and SETTINGS at the Porth Gas-Works.
The Drawings and Specifications may be seen, and Forms of Tender supplied, upon application to Mr. Octavius Thomas, the Engineer and Manager, Gas and Water Offices, Pentre, Glam., upon depositing the sum of Two Guineas, which will be returned on receipt of a *bond-fide* Tender, but to be forfeited in the case of withdrawal of Tender, after acceptance by the Council.
The Contractor will be required to pay the current rate of wages ruling in the district.
Tenders to be addressed to the Chairman of the Gas and Water Committee, endorsed "Contract No. 36," and delivered at my Office on or before Ten a.m. on Thursday, the 14th of June, 1906.
The Council do not bind themselves to accept the lowest or any Tender.
WALTER P. NICHOLAS, Clerk.
Council Offices, Pentre, Glam., May 31, 1906.

KEIGHLEY CORPORATION GAS-WORKS.

THE Gas Committee invite Tenders for the supply of B.O. VITRIOL and LIME, and the Purchase of SPENT OXIDE during the Twelve Months commencing on the 1st of July next.
Particulars and Form of Tender supplied on application.
Tenders to be delivered on or before the 11th of June next.
JOHN LAYCOCK, Gas Engineer.
Gas Offices, Cook Lane, Keighley, May 28, 1906.

STOKE-UPON-TRENT CORPORATION GAS-WORKS.

OXIDE OF IRON.

THE Gas Committee invite Tenders for the supply and delivery of 100 Tons of OXIDE OF IRON Purifying Material (moisture not to exceed 35 per cent.) at their Gas-Works on the North Staffordshire Canal.
Sealed Tenders, endorsed "Oxide of Iron," and addressed to the Chairman of the Gas Committee, must be delivered at the Offices, Wharf Street, before Noon on Tuesday, the 12th of June, 1906.
The lowest or any Tender not necessarily accepted.
WM. PRINCE, Engineer and Manager.
Gas Offices, Wharf Street, Stoke-upon-Trent.

LYMM URBAN DISTRICT COUNCIL.

TENDERS FOR CONDENSERS.

THE above Council are prepared to receive TENDERS for the supply and erection of CONDENSERS, with 9-inch Valves and Connections, suitable for dealing with 120,000 cubic feet per day.
For Particulars and Specification, apply to the Gas Manager, Mr. W. L. Donaldson.
Sealed Tenders, with detailed Drawings and Specification, to be delivered not later than Wednesday, the 20th of June inst., addressed to the undersigned, and endorsed "Tender for Condensers."
The Council do not bind themselves to accept the lowest or any Tender,
By order, W. MULLARD, Clerk to the Council.
Council Offices, Lymm, June 1, 1906.

ISLE OF THANET GASLIGHT AND COKE COMPANY, MARGATE.

TENDERS FOR SULPHATE OF AMMONIA.

THE Directors of the above Company are open to receive TENDERS for about 45 to 50 Tons of SULPHATE OF AMMONIA, made from Brown Acid. Colour, good grey. Prompt delivery can be had, either by Barge or L.C. and D. Rly., at Margate.
Payment before consignment.
Tenders to be sent in on or before Ten o'clock a.m. on Thursday, June 14, addressed to the Chairman of the Company.
The Directors do not bind themselves to accept the highest or any Tender.
Further Particulars can be had and samples sent on application.
By order, THOS. C. FULLER, Secretary.
The Offices, The Dane, Margate, June 1, 1906.

CORPORATION OF LOUGHBOROUGH.
(GAS DEPARTMENT.)

TENDERS FOR TAR AND AMMONIACAL LIQUOR.

THE Gas Committee invite Tenders for the surplus TAR and AMMONIACAL LIQUOR for Twelve Months, from July 1, 1906, to June 30, 1907.
Estimated amount of Tar 600 Tons; Liquor 1000 Tons.
The Contractor to state Price for Liquor at 5° Twaddel and per Ton extra for every 1° above 5°.
The Corporation to deliver both Tar and Liquor into Contractors' boats at the Derby Road Wharf, Loughborough.
Tenders, to be endorsed "Tenders for Tar and Liquor," and addressed and delivered to H. Perkins, Esq., Town Clerk, Town Hall, Loughborough, not later than the 23rd of June.
The Committee do not bind themselves to accept the highest or any Tender.
EDWARD ONIONS, Engineer and Manager.
May 30, 1906.

BOROUGH OF BEVERLEY.

TENDERS FOR COAL.

THE Gas Committee are desirous to receive TENDERS for the supply of not exceeding 7000 Tons of COAL, for use at the Gas-Works, Beverley, for a period of One Year, from the 30th of September next, to be delivered as from time to time directed, and at the expense of the Contractors, f.o.b. at Keadby or at the pits, or at the Railway Station, Beverley, according to terms of Contract.
The Coal to be of the best kind, well screened, free from Sulphur, Bats, Bind, Refuse, and Dirt, and to be weighed, 21 cwt. to the ton, upon the Corporation machine.
Payments will be made from time to time so long as the Contractors shall duly fulfil the Contract.
The Corporation do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right to divide the Contract as they think fit.
Further Information and Forms of Tender may be obtained of the Gas Manager, Mr. F. W. Oldfield, at the Gas-Works, Beverley, and Tenders, endorsed "Tender for Coals," must be delivered at my Office not later than Ten a.m. on Wednesday, the 27th day of June, 1906.
J. WILLIS MILLS, Town Clerk.

THE Corporation of Bury are prepared to receive TENDERS for the supply of—

40,000 Tons of GAS COAL
500 ,, BURGY
300 ,, HOUSE COAL
} more or less.

Forms of Tender and Conditions may be obtained on application to Mr. H. Simmonds, Engineer and Manager, Gas-Works, Bury.

Tenders, endorsed "Gas Coal," to be forwarded to the Town Clerk, Bury, not later than Friday noon, the 15th of June, 1906.

BRIDGEWATER COLLIERIES COKE-WORKS.
(THE EARL OF ELLESMERE.)

TENDERS are invited for the Tar produced at the above Works for a period of Six or Twelve Months from the 1st of July, 1906, delivered into Contractor's Tanks at the Bridgewater Colliery Siding, Wharton Hall, on the Pendleton and Hindley Branch of the Lancashire and Yorkshire Railway; or at the Brackley Siding, Little Hulton Mineral Branch of the London and North-Western Railway.

The estimated quantity is about 2600 Tons per annum.

Tenders, endorsed "Tender for Tar," to be addressed to Mr. THOMAS M. BROWN, Bridgewater Coal Offices, 4, Chapel Walks, MANCHESTER, not later than the 25th of June.

Manchester, May 29, 1906.

URBAN DISTRICT COUNCIL OF STOURBRIDGE.
(GAS DEPARTMENT.)

THE Gas Committee invite Tenders for the purchase of their surplus TAR during the Twelve Months ending June 30, 1907.

Tenders, endorsed "Tar," and addressed to the Chairman of the Gas Committee, to be sent to me on or before Tuesday, June 12, 1906.

The highest or any Tender not necessarily accepted.

By order of the Committee,
CHARLES H. WEBB, M.Sc., Assoc.M.Inst.C.E.,
Engineer and Manager.

Gas-Works, Stourbridge,
May 23, 1906.

ACCRINGTON DISTRICT GAS AND WATER BOARD.

THIS Board invite Tenders for the surplus TAR and AMMONIACAL LIQUOR which may be produced at the Accrington and Great Harwood Works of the Board, during the Year from the 1st of July next to the 30th of June, 1907.

The estimated quantity of Tar is 2000 Tons, and Liquor 5000 Tons.

Sealed Tenders, endorsed "Tar and Liquor," addressed to the Chairman of the Board, must be in my hands on or before Tuesday, the 12th of June.

By order,
CHARLES HARRISON,
General Manager.

General Offices, Accrington,
May 17, 1906.

BOROUGH OF NEWCASTLE-UNDER-LYME.
(GAS DEPARTMENT.)

THE Gas Committee invite Tenders for:

GAS COAL.

The supply and delivery of 11,000 Tons of GAS COAL and NUTS during the Twelve Months ending June 30, 1907.

TAR AND AMMONIACAL LIQUOR.

The purchase of the surplus TAR and AMMONIACAL LIQUOR produced during the Twelve Months ending June 30, 1907.

The Tar and Liquor to be taken in boats.

Tenders for the above to be sent to the Town Clerk on or before the 11th of June, 1906.

The Committee do not bind themselves to accept any Tender.

W. WINSTANLEY,
Engineer and Manager.

GREAT WESTERN RAILWAY.

THE Directors of this Company are prepared to receive TENDERS for the purchase of—

GAS TAR and AMMONIACAL LIQUOR.
HYDROCARBON from Oil-Gas-Works.
FURNACE SLAG, FETTLING AND MILL SCALE.
TARPAULIN CUTTINGS and SHEET TIES.
DIRTY GREASE.

Forms of Tender (upon which alone Tenders will be received) may be obtained on application to the undersigned, by whom Tenders, marked outside "Tender for Residuals," will be received on or before Tuesday, the 12th of June.

The Directors do not bind themselves to accept the highest or any Tender.

G. K. MILLS,
Secretary.

Paddington Station, London,
May 28, 1906.

HEBDEN BRIDGE AND MYTHOLMROYD GAS BOARD.

THE above Board are prepared to receive TENDERS for 8000 to 10,000 Tons of GAS COAL, to be delivered free into the Gas Board's Sidings at Hebden Bridge, in quantities as the Board may require during the next Twelve Months.

Forms of Tender and any further Particulars may be had on application to Mr. E. J. Wellens, Engineer and Manager.

Sealed Tenders, endorsed "Tender for Coal," and addressed to James Simpson, Esq., Chairman, Gas Board, Council Offices, Hebden Bridge, by noon on Wednesday, June 13, 1906.

The Committee do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right to divide the quantity as required.

By order of the Board,
R. CRABTREE,
Clerk.

Council Offices, Hebden Bridge,
May 16, 1906.

CORPORATION OF LANCASTER.
(GAS DEPARTMENT.)

TENDERS FOR GAS COAL.

THE Gas Committee are prepared to receive TENDERS for the supply of GAS COAL, NUTS, and rough GAS SLACK, to be delivered on the Gas-Works Siding, Lancaster, in such quantities, and at such times, as may be required during a period of Twelve Months, commencing delivery Aug. 1 next.

Sealed Tenders, endorsed "Gas Coal," giving full Particulars of the Coal offered, must be delivered to T. C. Hughes, Esq., Town Clerk, Lancaster, not later than Friday, June 15 next.

Any further Information and Forms of Tender may be obtained on application to the undersigned.

C. ARMITAGE,
Gas-Works, Lancaster. Manager.

THE GASLIGHT AND COKE COMPANY.

NOTICE is Hereby Given, that the TRANSFER BOOKS of this Company, so far as they relate to DEBENTURE STOCK and BONDS, WILL BE CLOSED at One o'clock p.m. on Saturday, the 9th prox., for the Half Year ending on the 30th prox., and will be RE-OPENED on the morning of Monday, the 11th prox.

The Interest for the Half Year will be payable, on the 2nd of July next, to the Proprietors registered on the closing of the Books.

By order,
HENRY RAYNER,
Secretary.

Chief Office: Horseferry Road,
Westminster, S.W., May 25, 1906.

MALTA AND MEDITERRANEAN GAS COMPANY, LIMITED.

TO THE SHAREHOLDERS.

NOTICE is Hereby Given, that the ORDINARY GENERAL MEETING of the Shareholders of this Company will be held at the Offices, 60, Gracechurch Street, London, E.C., on Tuesday, the 19th of June, 1906, at Twelve o'clock Noon, for the purpose of receiving the Report of the Directors and the Accounts for the Year ended the 31st of March, 1906, and for the transaction of the General Business of the Company.

One of the Directors, Mr. Arthur Matthews Paddon, retires from office, and offers himself for re-election.

The Auditors, Mr. Robert Hesketh Jones and Mr. Thomas Guyatt, retire, and offer themselves for re-election.

The TRANSFER BOOKS WILL BE CLOSED from the 5th of June until the day of the Meeting, both days inclusive.

By order of the Board,
A. W. COOPER,
Secretary.

60, Gracechurch Street, E.C.,
May 22, 1906.

BROMLEY GAS CONSUMERS' COMPANY.

SALE BY AUCTION OF £4000 "A" ORDINARY STOCK.

THE Directors give Notice that they have instructed Messrs. BAXTER, PAYNE, AND LEPPER, to SELL BY AUCTION, at the Bell Hotel, Bromley, Kent, on Thursday, the 21st day of June, 1906, at Eight o'clock p.m. precisely,

£4000 "A" ORDINARY STOCK

of the Bromley Gas Consumers' Company, in Lots of £100, £50, and £20 Stock. The Dividend on this class of Capital since the year 1898 has been at the rate of 6 per cent. per annum.

Particulars and Conditions of Sale may be obtained of the SECRETARY OF THE COMPANY, and of Messrs. BAXTER, PAYNE, AND LEPPER, Auctioneers, Market Square, BROMLEY, Kent, and 69, KING WILLIAM STREET, E.C.

By order of the Directors,
HENRY WILLIAM AMOS,
Secretary.

Offices: 156, High Street,
Bromley, Kent, May 22, 1906.

WALKER AND WALLSEND UNION GAS COMPANY.

SALE OF £10,000 ORDINARY STOCK.
MINIMUM PRICE, £133 PER CENT.

NOTICE is Hereby Given, that it is the intention of the Directors of the Walker and Wallsend Union Gas Company to SELL BY TENDER, to be received at the Company's Office, Neptune Road, Wallsend-on-Tyne, not later than Ten a.m. on the 8th day of June, 1906,

TEN THOUSAND POUNDS ORDINARY STOCK of the Company.

The Stock will be sold and issued under, and subject to, the Provisions of the Walker and Wallsend Union Gas Act, 1903. The Standard Rate of Dividend is Five per Cent. per Annum, subject to Sliding-Scale Clauses, under which, so long as the present price of Gas continues, the authorized rate of Dividend payable will be £6 7s. 6d. per Cent. per Annum.

Since the introduction of the Sliding-Scale in 1884, the Company has paid the Statutory Dividends authorized.

Any amount of Stock in multiples of £1 may be applied for. A deposit of £10 per cent. on the nominal amount of Stock applied for must accompany each Tender, and the balance be paid on or before the 30th of June, 1906. The Stock will be allotted to the highest Tenderers, but no Tender will be accepted at a lower Price than at the rate of £133 for each £100.

The quantity of Gas sold during the past Seven Years has increased 66 per cent.

The number of Consumers for the Year 1905 increased 17·11 per cent.

Prospectuses and Forms of Tender will be sent on application to the undersigned.

CHAS. H. ARMSTRONG,
Secretary.

Offices: Neptune Road,
Wallsend-on-Tyne, May 11, 1906.

ISSUES BY AUCTION OF GAS AND WATER STOCKS AND SHARES.

MR. ALFRED RICHARDS begs to notify that his ISSUES by AUCTION under PARLIAMENTARY POWERS of STOCKS and SHARES in LONDON, SUBURBAN, and PROVINCIAL GAS and WATER COMPANIES take place PERIODICALLY at the Mart, TOKENHOUSE YARD, E.C.

Terms for Issuing such Capital, and also for including Gas and Water Stocks and Shares belonging to Private Owners in these Periodical Sales, can be obtained on application at MR. ALFRED RICHARDS' OFFICES, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the
WORTHING GASLIGHT AND COKE COMPANY.

NEW ISSUE OF 200 £10 ORDINARY SHARES.

MR. ALFRED RICHARDS will Sell the ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, June 12, at Two o'clock, in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By Order of the Directors of the
SOUTH ESSEX WATER-WORKS COMPANY.

NEW ISSUE OF £15,000 FIVE PER CENT. ORDINARY STOCK.

MR. ALFRED RICHARDS will Sell the ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, June 12, at Two o'clock, in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the
WESTGATE AND BIRCHINGTON GAS COMPANY.

NEW ISSUE OF 300 £10 NEW ORDINARY SHARES.

MR. ALFRED RICHARDS will Sell the ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, June 12, at Two o'clock. in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By order of Executors.
NORTH PEMBROKESHIRE WATER AND GAS COMPANY.

EIGHTEEN £100 FOUR PER CENT. DEBENTURES.

MESSRS. EDWIN FOX & BOUSFIELD will include in their next STOCK AND SHARE AUCTION, at the Mart, London, E.C., on Wednesday, June 13, at 2.30 o'clock, the above DEBENTURES, in Lots.

Particulars at the AUCTIONEERS' OFFICE, 99, GRESHAM STREET, BANK, E.C.

SLOUGH GAS AND COKE COMPANY.
INCORPORATED 1866.

ISSUE OF NEW ORDINARY SHARES UNDER THE SLOUGH GAS ORDER, 1901.

THE Directors Hereby Give Notice that they are prepared to receive TENDERS for 450 NEW ORDINARY SHARES of £10 each.

The Dividend paid on New Ordinary Shares for the past Half Year was £8 1s. per cent., the Additional Dividend beyond 7 per cent. being paid according to the Sliding Scale on reduction in price of Gas.

Holders of this issue of Shares will be entitled to Dividend as from the 31st of July, 1906.

The Shares will be allotted to the highest Tenders.

Tenders must be delivered at the Secretary's Office, 46A, High Street, Slough, on or before the 28th of June, 1906, accompanied by a deposit of £1 per Share, and the balance must be paid on or before the 31st of July, 1906.

Full Particulars and printed Forms of Tender can be obtained at the London and County Bank, Slough; of Messrs. R. H. Barrett and Son, Solicitors, Slough and Eton; and of the Secretary.

By order of the Directors,
ARTHUR THOMAS,
Secretary.

46A, High Street, Slough,
Bucks, May 23, 1906.

By order of the Directors of the
CROYDON GAS COMPANY.

SALE OF £5000 CONSOLIDATED "C" ORDINARY STOCK, and £3750 FOUR PER CENT. PERPETUAL DEBENTURE STOCK.

MESSRS. HOOKER & WEBB will SELL BY AUCTION, at the Greyhound Hotel, Croydon, on Thursday, June 7, at Six o'clock precisely, in Lots to suit Buyers of large or small quantities,

£5000 CONSOLIDATED "C" ORDINARY STOCK
of the
CROYDON GAS COMPANY,

at present paying a Dividend at the rate of 10¾ per cent. per annum, but which Stock will, as from July 1, 1907, rank with the Company's "B" Stock, upon which latter the present Dividend is at the rate of 11½ per cent., and

£3750 FOUR PER CENT. PERPETUAL DEBENTURE STOCK

of the Company, affording exceptionally good opportunities for safe Investment of large or small sums.

Particulars and Conditions of Sale may be had at the OFFICES OF THE COMPANY; at the PLACE OF SALE; and of the AUCTIONEERS, 4, High Street, CROYDON. Telephone 122 Croydon.

An OPEN LETTER from a GAS MAN to the CHAIRMAN of a GAS COMMITTEE.

Dear Sir,

The most important question now before your Committee is the one dealing with the charges you make for Gas, and the consideration of what changes are requisite to extend our Sales.

Gas Undertakings are no longer in the possession of a Monopoly.

Gas Companies still suffer from restrictions placed upon them in exchange for a Monopoly.

Since the introduction of the Incandescent Gas-Burner, the light supplied by Gas Companies is far and away the cheapest artificial light of the World.

When economy is at all a factor, the supply of light must of necessity be obtained from the Gas Company.

The price of light as supplied by you has been reduced fully 50 per cent., not by re-arrangement of charges, but by the greater efficiency of the Burners used; and as a result, our Sales amongst Users of these Improved Burners has dropped fully 50 per cent. I therefore deprecate most strongly any further reduction being given to these customers.

The great problem to be solved is how best to obtain from these customers a demand for Gas which will bring their accounts to their original standard, or even enhance them. I am of opinion that Gas-Fires would be adopted in place of solid fuel if a reasonable reduction was given on the price of Gas used by same. The result would be increased Sales without the enormous expenditure of Capital entailed by taking in new areas; and I am satisfied the most regular and best paying consumer will in the future be the Householder who burns Gas as a Fuel in addition to using it for Lighting.

Space alone prevents my adducing further arguments in asking you to advocate and favour the policy of giving a reduction on Gas used in place of solid fuel.

Gas Fires will be greater Users than even Gas Engines.

I am, Yours faithfully,

Discount or Check Meters.

With one attached to the Gas Range or Fire, the User may keep informed as to the Gas used per day, week, or month, or per operation, and the Consumer will realize the trifling cost of Heating and Cooking by Gas.

	No. 1.	*No. 2.*	*No. 3.*
PRICE - -	15/6 -	15/6 -	16/6
With Unions -	16/6 -	16/6 -	17/6

For Full Particulars apply to

T. G. MARSH,

1, Mawson Chambers,

28, Deansgate, Manchester.

Printed and Published by Walter King, at No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, June 5, 1906.

TENTERDEN GAS COMPANY.

COAL.

TENDERS are invited for the supply of 700 tons, more or less, of best Sheffield Silkstone Screened GAS COAL (Birley Colliery) at the following Stations at such times, and in such quantities, as may be required: Appledore and Headcorn (S.E. & C. Rly.), also Rolvenden and Tenterden Town (Kent and East Sussex Light Railway).

Tenders, with analysis, to be sent to me on or before Friday, the 15th June inst.

The lowest or any Tender not necessarily accepted.

PRO. F. VARTY,
Secretary.

Tenterden, Kent,
June 2, 1906.

HAVERHILL URBAN DISTRICT COUNCIL.

TENDERS FOR COAL.

THE Haverhill Urban District Council invite TENDERS for the supply of 600, 1000, or 1600 Tons of Best GAS COAL (screened or unscreened) to be delivered free at the Haverhill (G.E.R.) Station in such quantities and at such periods as may be ordered from time to time between the 1st day of July next and the 30th day of June, 1907.

No Form of Tender is provided nor will be supplied.

The Council do not bind themselves to accept the lowest or any Tender.

Tenders, endorsed "Gas," to be delivered to me on or before the 12th day of June, 1906.

THOMAS BATES,
Clerk.

Haverhill, June 4, 1906.

FENTON URBAN DISTRICT COUNCIL.

TENDERS FOR GAS COAL.

THE Gas Committee of the above Council invite TENDERS for the supply and delivery of 7500 Tons of GAS COAL, BURGY, NUTS, or BEANS for the Twelve Months commencing the 1st of July next.

Specification and Form of Tender may be obtained on application to the undersigned.

Sealed Tenders, endorsed "Coal," to be forwarded to the Chairman, Gas-Works, Fenton, Staffs., not later than Thursday the 14th day of June, 1906.

The lowest or any Tender not necessarily accepted.

ROBERT SURTEES,
Engineer and Manager.

Gas-Works, Fenton, Staffs.,
May 31, 1906.

FENTON URBAN DISTRICT COUNCIL.

TAR AND AMMONIACAL LIQUOR.

THE Gas Committee of the above Council invite TENDERS for the purchase of the surplus TAR and AMMONIACAL LIQUOR made at their works during the Twelve Months commencing from the 1st day of July next.

Sealed Tenders to be sent in not later than Thursday, the 14th day of June, 1906, addressed Chairman, Gas-Works, Fenton, Staffordshire, and endorsed "Tender for Tar, &c."

The Committee reserve to themselves the right of accepting any Tender for the Tar or Liquor separately.

The Committee do not bind themselves to accept the highest or any Tender.

Further Particulars may be obtained on application to the undersigned.

ROBERT SURTEES,
Engineer and Manager.

Gas-Works, Fenton, Staffs.,
May 31, 1906.

THOMAS DUXBURY & CO.,
16, DEANSGATE, MANCHESTER.

Best Gas Coal and Cannel, giving High Illuminating Power, Large Yield per ton, and reasonable in Price.

Telegrams: "DARWINIAN, MANCHESTER."
Telephone 1806.

ARMSTRONG'S
PATENT
CANDLE SAFETY LAMPS.

Are a great improvement on Oil, giving a good Light, requiring little or no Cleaning, and when once lighted no further attention is necessary. The Candles are made to burn 5, 7, or 9 hours.

48, MANCHESTER STREET, GRAY'S INN ROAD, W.C.

'BUFFALO' INJECTOR

Operated Entirely by One Handle

Class A lifts 24 ft.
Class B lifts 12 ft.

SEND FOR LIST.

Telegrams: "Temperature London."
Tel. No. 12,455 Central.

GREEN & BOULDING
— LIMITED, —
28, New Bridge St. LONDON, E.C.

The Telegraphic Address
OF THE
STAFFORDSHIRE TUBE CO., LIMITED,
IS STILL
"UNBEATEN BIRMINGHAM."

THE
"BOYS"
CALORIMETER
for determining the calorific value of gases
IS MADE BY
JOHN J. GRIFFIN & SONS,
— LIMITED, —
Makers of Scientific Apparatus,
KINGSWAY, LONDON, W.C.

HEATHCOTE GAS COAL.

Rich in Illuminating Power and yield of Gas Above the Average in Weight and Quality of Coke.

Maintains a High Standard in Residuals.

THE GRASSMOOR CO., LD.,
CHESTERFIELD.

THE
"ROTARY"
STATION METER.

Efficiency Demonstrated.

APPLY—
T. G. MARSH,
MAWSON CHAMBERS, DEANSGATE, MANCHESTER.

JAMES OAKES & CO.,
ALFRETON IRON-WORKS, DERBYSHIRE,
AND
Wenlock Iron Wharf, 21 & 22, Wharf Road, CITY ROAD, LONDON, N.

Manufacture and keep in Stock at their Works (also large Stock in London)

PIPES and CONNECTIONS, 1½ to 48 inches in diameter, and make and erect to order RETORTS, PURIFIERS, and TANKS, with or without planed joints, COLUMNS, GIRDERS, SPECIAL CASTINGS, &c., required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

NOTE.—Makers of HORSLEY'S PATENT SYPHONS. These are cast in one piece, without Chaplets; doing away with Bolts, Nuts, and Covers, and rendering Leakage impossible.

TROTTER, HAINES, & CORBETT,
BRETTELL'S ESTATE LIMITED,
FIRE-CLAY & BRICK WORKS,
STOURBRIDGE.

Manufacturers of GAS-RETORTS, GLASSHOUSE FURNACE & BLAST-FURNACE BRICKS, LUMPS, TILES, and every description of FIRE-BRICKS.

Special Lumps, Tiles, and Bricks for Regenerative and Furnace Work.

SHIPMENTS PROMPTLY AND CAREFULLY EXECUTED.

LONDON OFFICE: H. CRESSWELL & Co., LEADENHALL CHAMBERS, 4, ST. MARY AXE, E.C.

MIRFIELD GAS COAL
UNEQUALLED.
Sperm Value 878·85 lbs. per Ton.

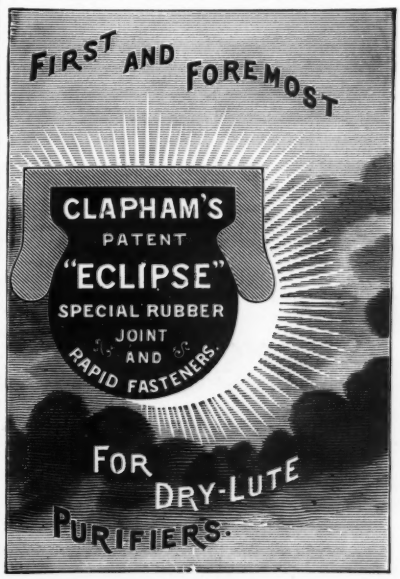
Please apply for Prices, Analyses, and Reports, to the
MIRFIELD (GAS COAL) COLLIERIES
RAVENSTHORPE, NEAR DEWSBURY.
LONDON: 22, Park Village East, N.W.

NEWBATTLE CANNEL.

Highest Results in Gas, & Excellent Coke.

QUOTATIONS ON APPLICATION TO
THE LOTHIAN COAL COMPANY,
LIMITED,
NEWBATTLE COLLIERIES,
NEWTONGRANGE, MIDLOTHIAN.

THOMAS TURTON AND SONS, LIMITED,
SHEAF WORKS, SHEFFIELD,
MANUFACTURERS OF
FILES OF BEST QUALITY FOR ENGINEERS.
STEEL OF ALL DESCRIPTIONS.
SCREW STOCKS, TAPS AND DIES, SPANNERS, RATCHET BRACES, LIFTING JACKS ANVILS, VICES, AND ENGINEERS' TOOLS GENERALLY.
LONDON OFFICE:
90, CANNON STREET, E.C.



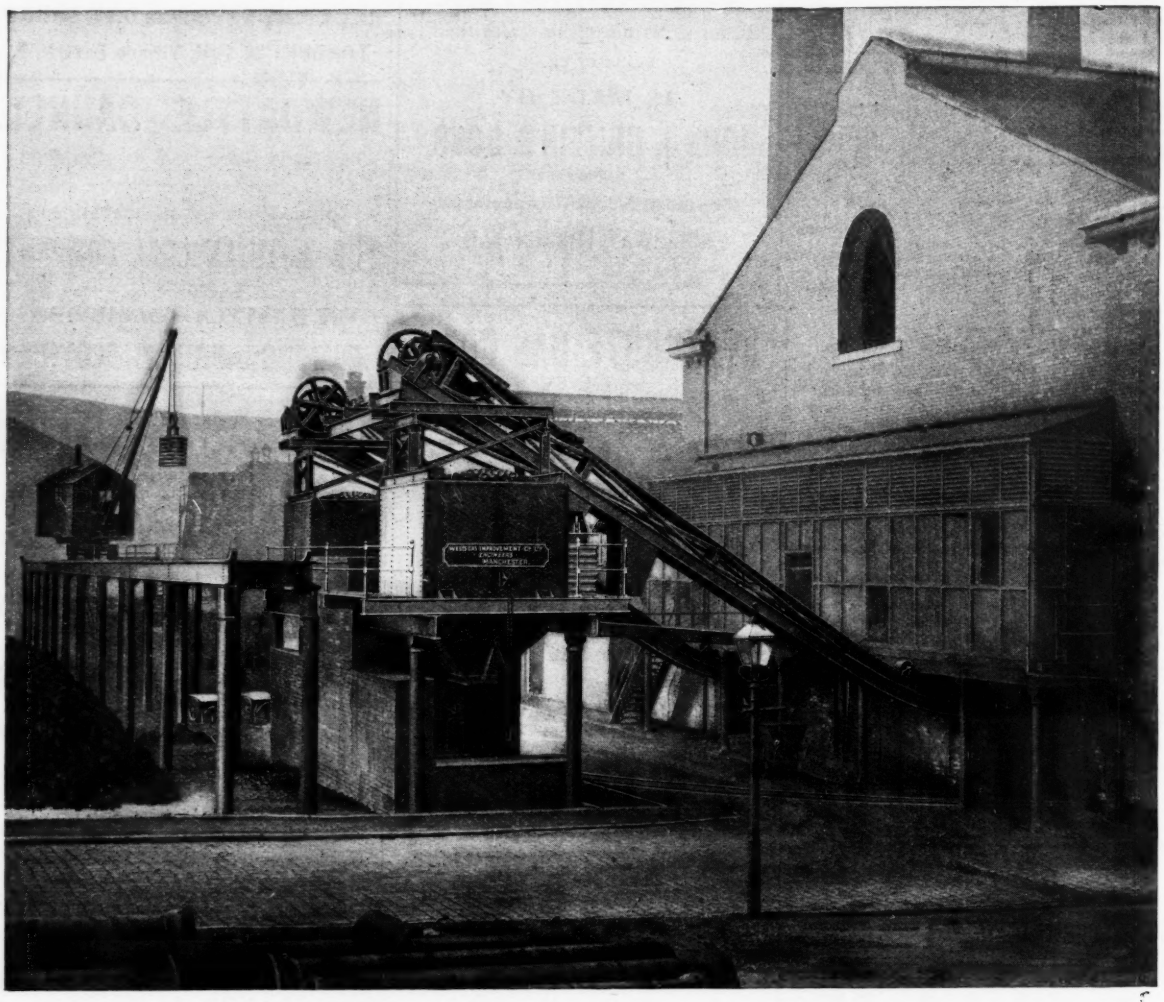
ALBION IRON WORKS,
MILES PLATTING,

MANCHESTER.
TELEGRAMS—
"STOKER, MANCHESTER."

WEST'S GAS IMPROVEMENT CO., LD.

Gas and General Engineers.

CONTRACTORS FOR
COMPLETE RETORT-HOUSE PLANT
EITHER ON
THE HORIZONTAL OR INCLINED SYSTEMS.



Photograph showing West's Coke-Conveyor dealing with the Coke from Nineteen Through Beds of Retorts.

WEST'S IMPROVED PATENT HOT-COKE CONVEYOR,

With Special Chain constructed with a minimum number of parts, and having Large Joint Pins with ample Bearing Surfaces.

WEST'S STOKING MACHINERY—COMPRESSED AIR DRIVEN AND MANUAL SYSTEMS.

COAL BREAKING, ELEVATING, & STORING PLANTS.

BELTON'S PATENT AUTOMATIC RELIEF APPARATUS FOR HYDRAULIC MAINS.

Manufacturers for America: Riter-Conley Manufacturing Company, Pittsburg.

THE Veeder DIRECT READING METER REGISTER.

Enables every Consumer to read his Meter instantaneously.
Any Child can read the Meter with this Register.

ACCURACY and EFFICIENCY ABSOLUTELY GUARANTEED.

Will last the **life of the Meter,** and means the saving of much valuable time for Meter Inspectors.

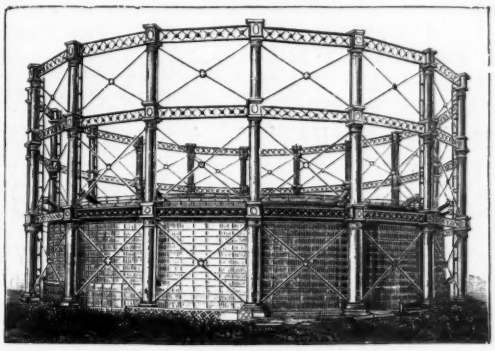
Full Particulars, Prices, &c., of—

SOLE BRITISH AGENTS,

MARKT & CO.,

6, City Road, Finsbury Square, LONDON, E.C.

Gasholders AND GAS PLANTS.



HUMPHREYS & GLASGOW'S CARBURETTED WATER-GAS PLANTS.

AGGREGATE CAPACITY OF PLANTS SUPPLIED, 169,700,000 CUBIC FEET DAILY.

PIPES	TANKS
Welded and Riveted.	Cast-Iron or Steel.

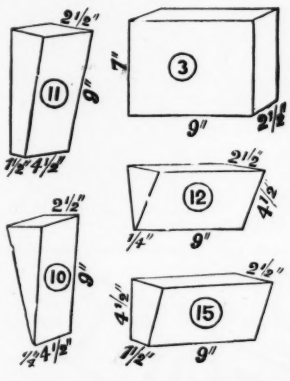
THOMAS PIGGOTT & CO., LTD.,

Telegrams: "ATLAS, B'HM." **BIRMINGHAM.** Telephone: B'HM: 86 & 4546.

London Office: 63, QUEEN VICTORIA ST.

STEPHENS & CO., KIDWELLY.

Contractors to a large number of the Principal Gas-Works.



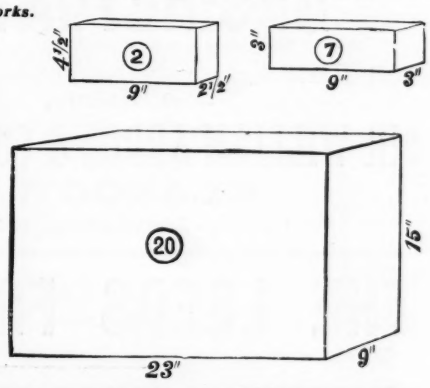
SPECIAL IMPROVED

SILICA BRICKS, BLOCKS, SHIELDS, TILES.

SPECIAL PLASTIC SILICA CEMENT.

Without doubt the finest Materials in the Market for Gas-Works Furnaces.

BRICKS, BLOCKS, TILES, & SHIELDS of any shape made to order.



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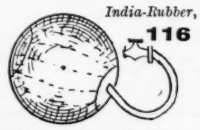
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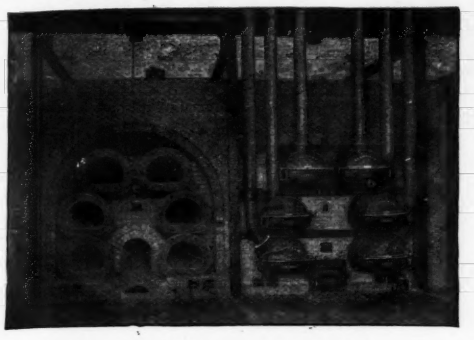

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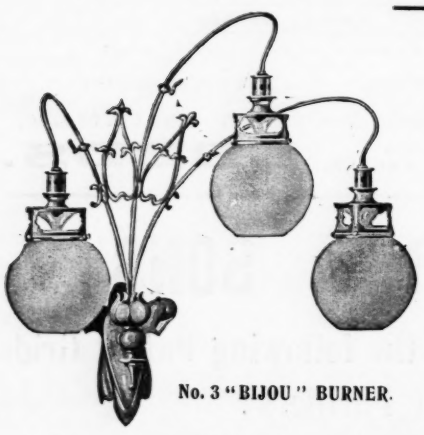

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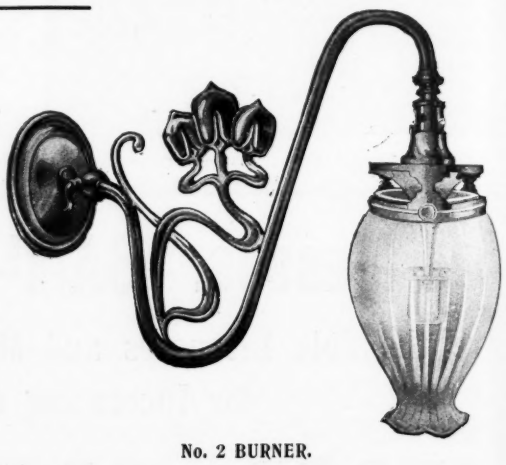

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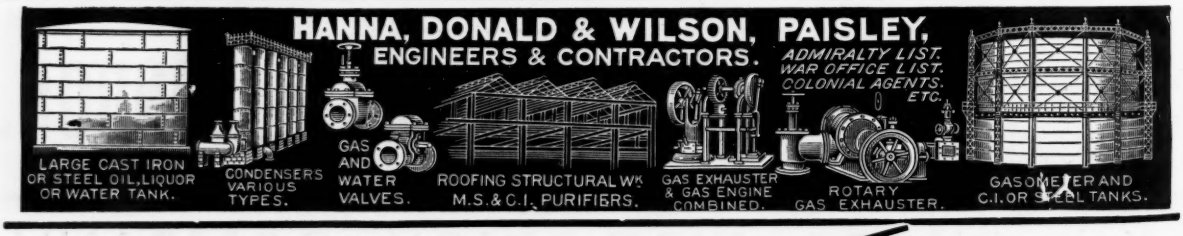
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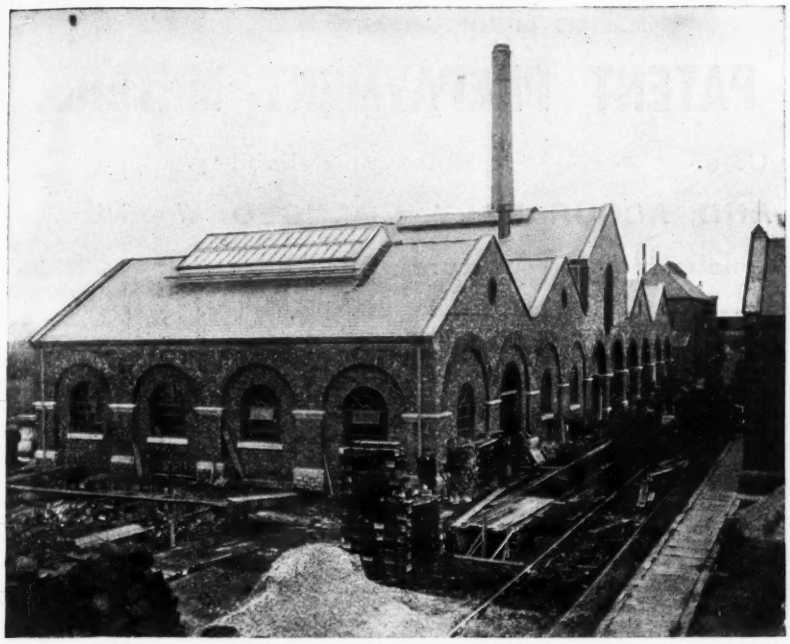

Photo. showing Methane-Hydrogen Plant under construction at the Great Western Railway Gas-Works, Swindon.

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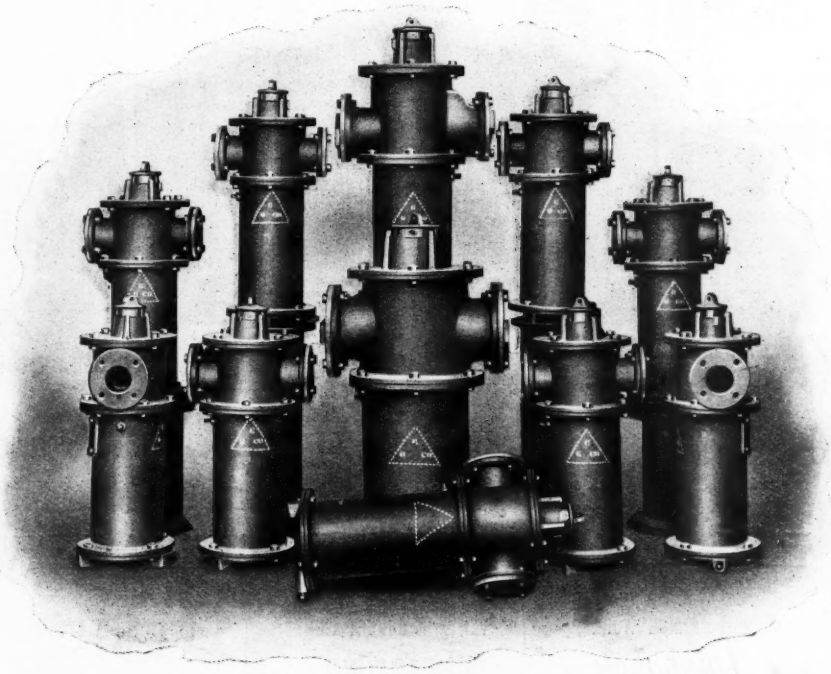

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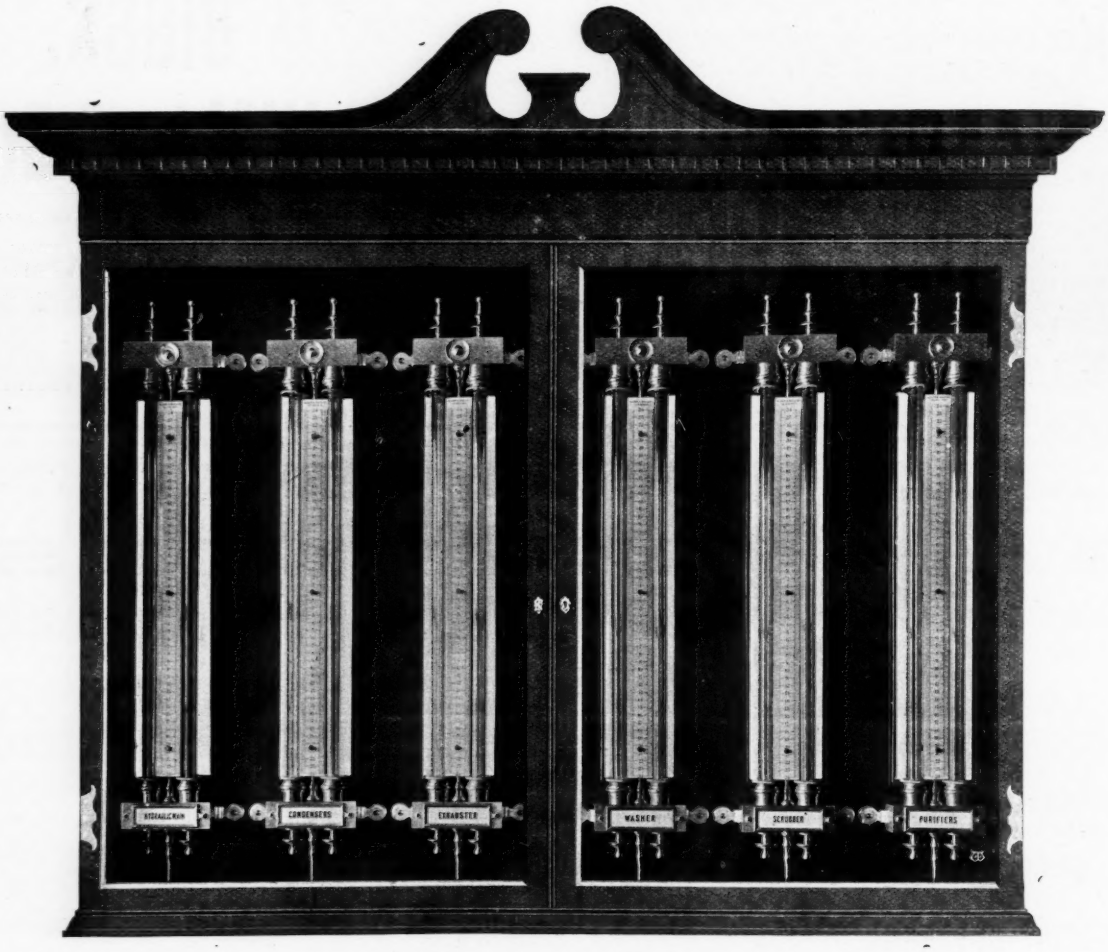

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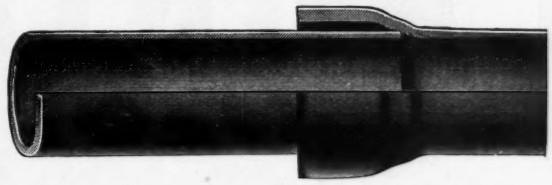

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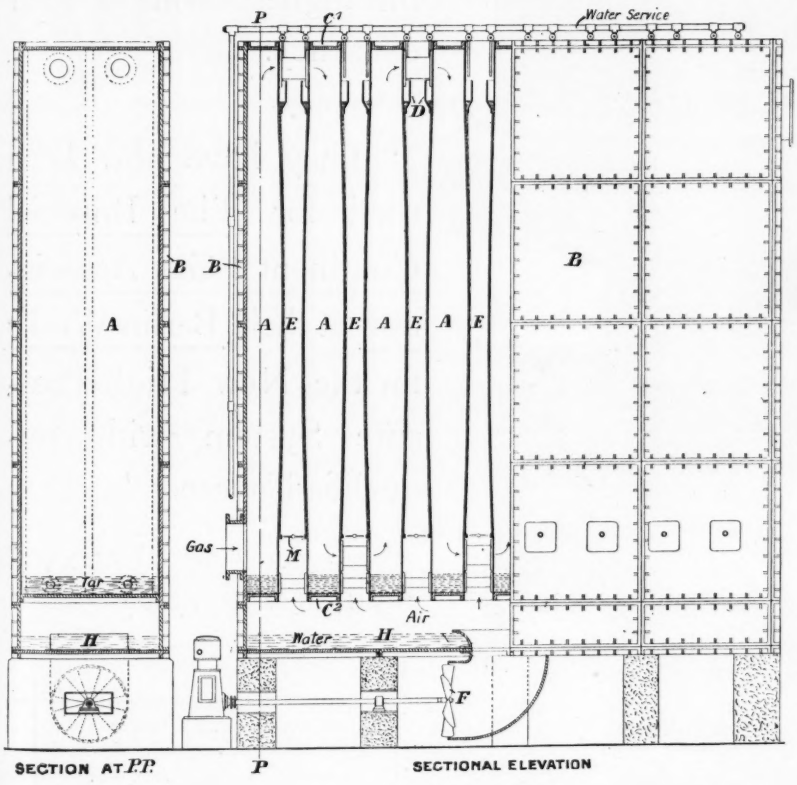

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(See report "GAS JOURNAL," p. 501, May 22, 1906.)

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See also Advt. on p. 626.

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